

PROCEEDINGS
of the Fourteenth Meeting of the
All India Council for Technical
Education

NEW DELHI JULY 7, 1951



MINISTRY OF
SCIENTIFIC RESEARCH AND CULTURAL AFFAIRS
GOVERNMENT OF INDIA

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PROCEEDINGS OF THE 14TH MEETING OF THE
ALL INDIA COUNCIL FOR TECHNICAL
EDUCATION HELD AT NEW DELHI
ON 7TH JULY 1961

1. The 14th meeting of the All India Council for Technical Education was held at New Delhi on the 7th July 1961 at 10.00 a.m. Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs presided over the deliberations.

2. The following were present:—

- (i) Dr. M. M. Das Deputy Minister of Scientific
Research & Cultural
Affairs
- (ii) Prof. M. S. Thacker Educational Adviser (Tech.)
to the Government of
India

Members of Parliament

- (iii) Shri Ranbir Singh Lok Sabha
Chaudhury
- (iv) Shri N. Keshava Lok Sabha
- (v) Shri K. Santhanam Rajya Sabha

Planning Commission

- (vi) Dr. A. N. Khosla

Ministries of Government of India

- (vii) Dr. B. D. Kalelkar Ministry of Commerce and
Industry
- (viii) Brig. P. S. G. Trivedi Ministry of Defence
- (ix) Shri A. V. Venkateswaran Ministry of Finance
- (x) Shri Abdul Kadir Ministry of Labour and
Employment
- (xi) Shri A. B. Guha Ministry of Steel, Mines &
Fuel (Deptt. of Mines &
Fuel)

- | | |
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| (xii) Shri M. C. Misra | Ministry of Steel, Mines & Fuel (Deptt. of Iron & Steel) |
| (xiii) Shri V. K. Rao | Ministry of Works, Housing and Supply |
| (xiv) Shri I. Hyderi | Ministry of Railways |
| (xv) Shri R. Prasad | Ministry of Home Affairs (Directorate of Manpower) |
| (xvi) Shri V. S. Rao | Ministry of Food and Agriculture |
| (xvii) Shri H. P. Sinha | Ministry of Transport and Communications (Deptt. of Transport) |
| (xviii) Dr. S. Ramamirthan | Ministry of Transport and Communications. (Deptt. of Civil Aviation) |
| (xix) Shri P. H. Vaidyanathan | Central Board of Irrigation and Power |

State Governments

- | | |
|--|----------------|
| (xx) Shri C. V. D. Murthy,
Director of Technical Education | Andhra Pradesh |
| (xxi) Shri Radhika Das,
Dy. Minister for Education
(Accompanied by Director of Education and the Under Secretary, Education Deptt., Assam) | Assam |
| (xxii) Shri K. N. Sinha,
Deputy Minister for Industries | Bihar |
| (xxiii) Dr. M. V. Kesava Rao,
Director of Technical Education | Kerala |
| (xxiv) Shri T. N. Tolani,
Director of Technical Education | Maharashtra |

- (xxv) Shri S. D. Sharma, Madhya Pradesh
Minister for Education and Law
- (xxvi) Shri K. Srinivasan, Madras
Secretary, Education & Public Health Deptt.
(Accompanied by Director of Technical Education, Madras)
- (xxvii) Shrimati Grace Tucker, Mysore
Deputy Minister for Education (Accompanied by Under Secretary, Education Department, Mysore)
- (xxviii) Shri Niranjan Singh Punjab
Talib, Deputy Minister for Public Works
- (xxix) Shri V. G. Garde, Rajasthan
Director of Technical Education
- (xxx) Dr. D. M. Sen, West Bengal
Secretary, Education Department
- (xxxi) Shri A. S. Lall, Delhi
Director of Employment and Training
- (xxxii) Shri H. C. Bhardwaj, Himachal Pradesh
Principal, Government Polytechnic, Sundernagar

Industry and Commerce

- (xxxiii) Shri Kanchanlal C. All India Organisation of
Parikh Industrial Employers.
- (xxxiv) Prof. G. M. Nabar Employers' Federation of
India

- (xxxv) Shri Sookamal Ghose Federation of Indian Chambers of Commerce & Industry
- (xxxvi) Prof. M. P. Gandhi Federation of Indian Chambers of Commerce & Industry

Labour

- (xxxvii) Prof. K. V. Subrahmanyam All India Trade Union Congress

University Grants Commission

- (xxxviii) Dr. D. S. Kothari
- (xxxix) Dr. V. S. Patankar

Central Advisory Board of Education

- (xl) Dr. Mohan Sinha Mehta

Inter University Board of India

- (xli) Dr. A. L. Mudaliar

National Institute of Sciences of India

- (xlii) Prof. R. C. Majumdar

National Council for Rural Higher Education

- (xliii) Shri T. S. Avinashilingam Chettiar, M.P.

Association of Principals of Technical Institutions (India)

- (xliv) Dr. T. Sen
- (xlv) Shri G. R. Damodaran

National Productivity Council

- (xlvi) Shri H. D. Shourie

Professional Bodies

- (xlvii) Major General Har- Institution of Engineers (India)
kirat Singh
- (xlviii) Shri H. N. Dallas Indian Institute of Architects, Bombay

Nominees of the Government of India

Chairmen of Regional Committees (Ex-Officio)

- (1) Lala Shri Ram . Northern Regional Committee.
 Dr. A. L. Mudaliar . Southern Regional Committee

Chairmen of All India Boards of Technical Studies (Ex-Officio)

- (ii) Dr. V. K. R. V. Rao . Commerce
 Lala Shri Ram . . Textile Technology
 (iii) Shri N. K. Mitra . Engineering & Metallurgy
 (iii) Shri M. Fayazuddin . Architecture & Regional Planning
 (liv) Dr. G. P. Kane . Chemical Engineering and Chemical Technology

Secretary

- (iv) Shri G. K. Chandiramani . Joint Educational Adviser (Tech.) to the Government of India

Shri L. S. Chandrakant, Shri Biman Sen and other Officers of the Technical Division of the Ministry of Scientific Research & Cultural Affairs were also present.

Shri D. K. Malhotra and Shri K. L. Joshi of Planning Commission, Shri S. C. Sen, Principal, Delhi Polytechnic, Shri T. J. Manickam, Director, School of Planning & Architecture and Shri R. N. Dogra, Principal, College of Engineering and Technology, Delhi attended by special invitation.

3. The following members were unable to attend :—

Ministries of Government of India

- (i) Dr. K. L. Rao . Ministry of Irrigation & Power
 (ii) Shri A. C. Ramchandani . Ministry of Information and Broadcasting
 (iii) Shri H. N. Sethna . Deptt. of Atomic Energy

State Governments

- (iv) Director of Technical Education, Gujarat

- (v) Principal, Kashmir Government Polytechnic Jammu & Kashmir
- (vi) Chief Minister, Orissa Orissa
- (vii) Deputy Minister for Industries, Uttar Pradesh Uttar Pradesh
- (viii) Shri S. D. Bahuguna, Director of Education Manipur
- (ix) Chief Commissioner, Tripura Tripura

Industries and Commerce

- (x) Shri B. F. Goodchild } Associated Chambers of
Commerce of India
- (xi) Shri Bharat Ram }
(xii) Shri R. H. Modi . All India Organisation of
Industrial Employers
- (xiii) Shri G. Y. Mangrulkar Employers Federation of
India

Labour

- (xiv) Shri Michael John } Indian National Trade
Union Congress
- (xv) Shri Shantilal Shah }
(xvi) Shri Shanta Ram S. Hind Mazdoor Sabha
Tawade

Nominees of Government of India

- (xvii) Shri M. Hayath

Chairmen of Regional Committees (Ex-Officio)

- (xviii) Shri J. J. Ghandy . Eastern Regional Committee.
- (xix) Seth Kasturbhai Lalbhai Western Regional Committee

Chairmen of Boards of Technical Studies (Ex-Officio)

- (xx) Prof. V. N. Adarkar Applied Art
Shri . . . Ghandy Management

4. The Chairman referred to the loss suffered by the country in the death of Dr. K. S. Krishnan, who had worked all his life for the cause of education and research. Dr. Krishnan brought honour and distinction to the country in scientific research but his interests were not confined to science alone, for he was a man of great humanitarian instincts. His loss, the Chairman said, was mourned not only by his friends and relations in this country but by scientists throughout the world. He served on many committees of the Council and it was extremely difficult to fill the void caused by his death. All the members stood in silence for a minute in memory of Dr. Krishnan and passed the following condolence resolution :

“The All India Council for Technical Education places on record its deep sense of loss and profound sorrow at the passing away of Dr. K. S. Krishnan. Dr. Krishnan had served the cause of education and research well and truly and had been associated with a number of committees of the Council. In his death, the country and the Council have suffered an irreparable loss.”

5. The Chairman welcomed the members to the meeting and delivered his inaugural address. A copy of the address is at Annexure I.

6. Before proceeding with the consideration of the Agenda, the Chairman invited the members to a general discussion on the problems of Technical Education in the country. During the course of the general discussion, the following points were made :—

(a) The present policy regarding Central assistance to technical education schemes should be reviewed. The Finance Commission would no doubt examine the needs of the States and recommend funds to the State Governments in order to enable them to support the developmental activities started during the Five Year Plan periods. Still, the Centre should assume permanent liability of some magnitude in the larger interests of technical education.

(b) The standards in technical institutions are falling due to lack of staff. Urgent steps should be taken to improve the position. Practising engineers should be asked to work as teachers for stated periods. For instance, an Executive Engineer, before being promoted to the post of Superintending Engineer, should be asked to work as a teacher for two or three years. That would bring to the institutions the practical experience gained by senior engineers

and at the same time, give an opportunity to the engineers themselves to be in touch with the academic part of their subjects.

(c) Arrangements should be made to produce the equipment required by our institutions, within the country. Wherever that is not possible, adequate foreign exchange should be made available for the import of essential items.

(d) In some institutions, wastage is very high and the matter should be examined in order to assure that the facilities are properly utilised.

(e) In sanctioning grants to technical institutions, the Central Government should prescribe the condition that the admissions should be made by pooling the seats in the institutions in each State.

(f) The Plan provision made for Technical Education in the Third Five Year Plan is not adequate for the training of competent and high grade engineers. At the same time, administrative and other procedures should be simplified in order to make an effective use of the funds.

(g) In view of the reservation of seats made in favour of scheduled castes, scheduled tribes and other backward classes which, however, is necessary, students with different standards of educational attainment are admitted. Special measures should be adopted by the institutions, as for instance extra tutorial classes in order to bring them up to the required standard. Efforts should also be made by the institutions to take those students who are not upto the mark to some other class. In certain cases, an additional year may have to be prescribed for these students in order to bring them up on a par with other students.

(h) Housing for teachers of technical institutions is important. In its absence, institutions will find it extremely difficult to attract well qualified persons to the teaching profession. If the Government cannot find the funds required for housing, the possibility of securing them on loan from the Life Insurance Corporation should be considered.

(i) A Central Agency should be set up in each State for selecting candidates for admission to institutions. In order, however, to meet some special situations as for instance, late announcement of the results of some candidates, the head of each institution should be given the discretion to admit upto three candidates provided that these candidates have secured at least 65% marks in the qualifying examination and have not been rejected by the Central Selection Board.

7. The Council then proceeded to consider the agenda. (Annexure II).

ITEM NO. 1.—To confirm the Minutes of the Thirteenth Meeting of the Council

8. It was reported that the minutes of the 13th Meeting of the Council held at New Delhi on the 30th April, 1960, were circulated to the members, and in the light of the comments received, the following amendments had been approved by the Chairman :—

ITEM NO. 2—(last para)

“The Council strongly recommended the continuance of the financial support to the Administrative Staff College at Hyderabad with an annual recurring grant or subscription. The Council was not in a position to make specific recommendations regarding the amount which should be paid annually and desired that this should be decided after a scrutiny of the full details pertaining to the running of the College. The Council further desired that a comprehensive note on this college and its working should be placed before it at the next meeting.”

ITEM NO. 14.—Northern Regional Committee

Conversion of Ceremonial Halls into Drawing Halls.

“The Council approved the recommendations of the Regional Committee that the Ceremonial Hall constructed at the Government Technical Institute, Gorakhpur may be converted into Drawing Hall by providing wooden partition at the cost of the State Government and the expenditure incurred at the Hall may be regarded as admissible item under the developmental programme for Central grants.

As regards the Government Textile Institute, Kanpur, the Council recommended that the Ceremonial Hall may continue as a regular auditorium and the State Government may construct a separate Dye House for the Institute at their own cost.”

9. The above amendments were circulated to the members and no further comments were received. The Council confirmed the proceedings with the above amendments.

ITEM No. 2.—To Report the Membership of the Reconstituted Council

10. The Council noted its membership as reconstituted.

ITEM No. 3.—To Report the action taken on the Recommendations and Decisions of the Council made at the 13th Meeting

11. The Council recommended that State Governments should be requested to make every effort to persuade industrial and commercial concerns in their respective areas to assist in the staffing of technical institutions by deputing their experts to do part-time teaching work. Engineers in the State Public Works Departments should also be deputed for teaching ; this would be facilitated if the Chief Engineer of the State is made an *ex-officio* member of the State Board of Technical Education. The Council further recommended that the different Ministries and Departments of the Central Government should ask the various Central Government undertakings to assist on similar lines.

12. On the question of admissions to the various institutions, the Council reiterated its previous recommendation regarding the setting up of a Central agency in each State and pooling of seats in all institutions. The Council also, recommended that in order to meet some special situations as for instance, the late announcement of the results of some candidates the head of each institution should be given the discretion to admit upto three candidates provided that these candidates have secured at least 65% marks in the qualifying examination and were not rejected by the Central Selection Board of the State.

ITEM No. 4.—To Report on the Important Decisions taken by the Co-ordinating Committee since the Last Meeting of the Council

13. The Council recorded the report.

14. The Council noted with serious concern the shortage of staff in the various institutions including those set up during the Second Five Year Plan period. The Council recommended that no new institutions should be established in a State unless the existing institutions were adequately staffed.

ITEM No. 5.—To Report on the Progress of Schemes of Technical Education included in the Second Plan.

15. The Council recorded the report.

ITEM No. 6.—The all India Boards of Technical Studies (a) Matters for report. (b) Matters for decision.

I. APPLIED ART BOARD

16. The Council noted that the Applied Art Board did not favour the establishment of a separate section in the Art Department of the Delhi Polytechnic for the training of the deaf and dumb and agreed with the view of the Board that physically handicapped students should be entitled to the same diplomas and certificates as other students so that they could pursue their vocation with competence and face life with confidence. In their case, however, exemptions may have to be given from certain tests.

17. The Council suggested that the question of extending technical training facilities for the physically handicapped in other forms, as for instance, Junior Technical Schools, may be given due consideration.

18. The Council accepted the recommendation of the Applied Art Board that no revision was necessary to the existing examination rules in respect of part-time students in Applied Art and Printing.

19. The Council approved the recommendation of the Applied Art Board that estimates of library for Regional Schools of Printing be revised as shown below :—

	Rs.
Library books	20,000
Library equipment and furniture	5,000
Journals and periodicals	1,500 per year.

20. The Council noted that the Co-ordinating Committee had, at its meeting held on the 1st March, 1961, accepted the recommendation of the Applied Art Board that four art institutions be selected on a regional basis and developed for training in Industrial Design. The Co-ordinating Committee had further approved the recommendation of the Board that Sir Gordon Russel, Director General, Council of Industrial Design, U. K. should be invited to visit India

and advise on the setting up of these Industrial Design training centres.

21. The Council accepted the recommendation that the Delhi Polytechnic, Delhi, the Government College of Arts and Crafts, Calcutta, the Government College of Arts and Crafts, Madras and the J. J. Institute of Applied Art, Bombay, be selected as the four centres for the development of facilities in Industrial Design. The Council also recommended that in view of the fact that facilities in this field are proposed to be developed at this stage in only four centres, the admissions to the institutions should be open to students of other States where such facilities do not exist to the extent of 50% of the seats available. Further, a team of four experts drawn from these institutions should be sent abroad to study the latest developments in Industrial Design.

22. The Council recommended that the services of Sir Gordon Russel may be secured under any one of the Aid Programmes, and in case he was not available, efforts should be made to obtain the services of Mr. Hans Schleger.

23. The Council considered the revised scheme of National Diploma Course in Applied Art as formulated by the Applied Art Board, and approved the scheme.

24. The Council also accepted the estimates of cost for a model Art School, as recommended by the Applied Art Board subject to the proviso that the estimates in respect of students' common room, canteen and other items of students amenities should be revised in accordance with the standards already laid down for other technical institutions.

II. BOARD OF MANAGEMENT STUDIES

25. The Council noted that the existing centres for Management Studies conducted only part-time courses and as such only candidates working in those areas could avail themselves of the facilities. The need for Management Education and Training is, however, being increasingly felt in other areas. The Council therefore recommended that facilities in the field should be extended further and new centres should be started provided that the necessary conditions were satisfied. In selecting new centres, every care should be exercised that an adequate number of candidates possessing the prescribed qualifications and experience are available to take advantage of the courses and satisfactory arrangements are made for both full-time and part-time staff.

26. The Council approved the following additional centres for Management courses together with the estimates of cost as shown for each :—

Thyagaraja College, Madurai

Courses—Part-time courses in Business Management and Industrial Management :

<i>Approved intake</i> :—	30 to each of the two courses.
<i>Accommodation</i> :—	18,000 sq.ft.
<i>Equipment, Library and furniture</i> :—	Rs. 1,08,500
<i>Recurring</i> :—	Rs. 1,50,000 per year

(The Trust authorities have agreed to make available the necessary accommodation in the new buildings of the Thyagaraja College, Madurai.)

Lucknow University

Courses—Part-time courses in Business Management and Industrial Management :

<i>Approved intake</i> :—	30 to each of the two courses
<i>Accommodation</i> :—	17,500 sq. ft. at Rs. 13 per sq. ft. Rs. 2,27,500
<i>Equipment, Library and Furniture</i> :—	Rs. 93,500
<i>Recurring</i> :—	Rs. 1,50,000 per annum.

Allahabad University

Courses—Part-time courses in Business Management and Part-time or full-time courses on the slab system for Industrial Management :

<i>Approved intake</i> :—	30 to each of the two courses
<i>Accommodation</i> :—	18,000 sq. ft. at Rs. 13 per sq. ft. Rs. 2,34,000
<i>Equipment, Library and Furniture</i> :—	Rs. 1,08,500
<i>Recurring</i> :—	Rs. 1,50,000 per annum

The Council further recommended that the following conditions be prescribed for Central assistance to the above centres :

- (a) To facilitate migration of candidates from one institution to another, the syllabus prescribed by the Board should be adhered to, with only minor variations, wherever necessary.

- (b) Persons admitted to the course should have a minimum of two years' industrial/commercial experience. There should be no relaxation of this rule for full-time or part-time students and it would be the responsibility of the institutions concerned to ensure that this condition is strictly observed.
- (c) Every institution approved for a course of study in Management should draw up a programme for the appointment of full-time staff. A list of persons who have agreed to serve as teachers on a part-time basis should also be prepared. Admissions to the courses should be made only after satisfactory arrangements have been made for the appointment of full-time and part-time staff and this should be in accordance with the pattern approved by the Courses Committee of the Board.

The Council did not accept the suggestion of the Board that a minimum age limit should be prescribed in respect of admission only to Lucknow and Allahabad centres. The Council recommended that no minimum age limit was necessary as long as the candidates fulfilled the minimum academic qualifications and practical experience prescribed for admissions to the courses.

27. The Council recommended that building grant of Rs. 2.53 lakhs (17,000 sq. ft.) be sanctioned to the Delhi University for providing separate accommodation for the Department of Management Studies.

28. Arising out of the above proposals for new centres of Management Studies, the Council recommended that the pattern of Central assistance for Management Studies should be 50% for non-recurring expenditure and 50% for recurring expenditure for a period of five years.

III. ENGINEERING BOARD

29. The Council accepted the suggestion of the Engineering Board that the syllabuses prescribed for the Higher Secondary Schools should be examined in relation to the existing syllabuses for the National Certificate Course in order to determine the manner in which the latter should be revised.

30. The Council recommended that since the Planning Commission was reviewing its estimates of the requirements

for personnel in Electrical Communication Engineering, the question of further expansion of facilities in this field should be considered only after firm estimates were available.

31. The Council noted that in pursuance of its decision in 1959, Delhi Polytechnic had prepared a scheme of part-time National Diploma Course for the benefit of National Certificate holders and introduced the course. The Engineering Board had approved the scheme.

32. The Council was of the view that a stage had been reached at which the entire question of the aims and objects of Diploma Courses their contents and standards of training and other aspects should be reconsidered in relation to the changing pattern of employment of technical personnel in industry and other sectors. The courses should be reorganised with a view to training the correct types of personnel needed for the industrial development of the country. The Council, therefore, recommended that a small Expert Committee should be set up for the purpose. Representatives of industry and technical institutions should be closely associated with the Committee.

33. Pending a detailed examination of the diploma courses as suggested above, the Council recommended that the question of whether training in Refrigeration and Air-Conditioning should be organised at post-Diploma level or otherwise should be deferred.

34. The Council was of the view that no change was needed at this stage in respect of the pattern of degree course in Electrical Communication Engineering.

IV. CHEMICAL ENGINEERING BOARD

35. The Council noted that an indication had been given by the representative of the Planning Commission that the requirements for Chemical Engineers in the fourth Plan would be of a large order (*viz.*, 6000—7000). The Council, therefore, recommended that steps should be taken right now to expand facilities in this field. For this purpose, the admissions to the existing centres of Chemical Engineering should be increased to 60 wherever they are less than this number, from the current academic year or as soon as possible. The question of whether these additional admissions should be made in the beginning of the normal academic session or in the middle should be left to the institutions to decide.

36. The Council further recommended that the Chemical Engineering Board should examine the question of additional centres to be started and formulate necessary proposals.

37. As regards Operators for chemical industry the Council recommended that as many additional training centres as possible should be started in co-operation with industry.

38. The Council agreed with the recommendation of the Chemical Engineering Board that the Victoria Jubilee Technical Institute, Bombay should not start a degree course in Technical Chemistry.

39. The Council considered the recommendation of the Board that there was no need to start diploma Courses for the training of Oil-mill Superintendents and Foremen. It was noted that the Marketing Sub-Committee of the Indian Central Oilseeds Committee had disagreed with the view of the Board. The Council recommended that the matter be reconsidered by a Technical Committee.

40. In the course of discussions on the question of expansion of facilities in various specialised fields it was pointed out that in view of the reduction made by the Planning Commission in the financial provision for the Central Plan, it would be impossible to provide the necessary facilities without additional funds being made available for the purpose. Dr. A. N. Khosla, Member, Planning Commission, suggested that programmes on the basis of the present allocation of Rs. 70 crores should be prepared and proceeded with. If in the course of the implementation of the programmes, further need arose for training facilities in order to meet the requirements for personnel and additional funds were required for the purpose, the Planning Commission would consider the matter favourably.

ITEM No. 7:—The Regional Committees (a) Matters for report. (b) Matters for decision.

I. WESTERN REGIONAL COMMITTEE

41. The Council noted that the Western Regional Committee had revised the Model List of equipment and had estimated the cost of equipment for the States of Madhya Pradesh, Maharashtra and Gujarat, as shown below :—

	Rs.
Madhya Pradesh	9,80,500
Maharashtra & Gujarat	9,91,771

42. The Council accepted the suggestion of the Western Regional Committee that in view of the preference of the students for University degree courses, the question of organising special degree courses for diploma-holders instead of part-time National Diploma or State Advanced Diploma courses should be examined. The Council also accepted the recommendation of the Committee that the scheme should be introduced on an experimental basis at a few selected institutions in the Region.

43. The Council recommended the following additional estimates for the introduction of Diploma Course in Mechanical Engineering at the Sir Casrow Wadia Institute of Electrical Technology, Poona :—

<i>Non-recurring</i>		Rs.
Equipment, library & furniture		85,600
<i>Recurring</i>		7,845
		per annum.

(The Council noted that the total estimates of the cost of equipment would be Rs. 3,52,161 instead of Rs. 3,51,561 as given in the Agenda papers).

44. The Council recommended the following revised estimates for the St. Xavier's Technical Institute, Bombay :—

	Rs.
Buildings (Plinth area 26,535 sq. ft.)	5,30,700
Equipment, library and furniture	1,30,200
TOTAL	6,60,900

45. The Council recommended the following estimates of cost for the establishment of Kilachand Devchand Polytechnic, Patan :—

<i>Non-recurring</i>		Rs.
Buildings (plinth area 54,582 sq. ft.)		9,25,000
Equipment, library and furniture		11,30,271
TOTAL		20,55,271
<i>Recurring (Ceiling)</i>		2,60,172
		per annum.
<i>Hostel for 180 students</i>		5,77,500

The Council further recommended that the admissions to the Civil Engineering course should not exceed 60 students

nor, should Mechanical and Electrical Engineering courses be started till adequate instructional facilities had been provided in the institution.

46. The Council recommended the following estimates of cost for the establishment of a Polytechnic at Broach :—

Non-recurring

	Rs.
Buildings (Plinth area 54,582 sq. ft.)	9,14,200
Equipment, library and furniture	11,30,270
TOTAL	20,44,471

Recurring (Ceiling) 2,60,172
per annum.

Hostel 5,77,500

The Council recommended that the admissions to the Civil Engineering course should not exceed 60 nor, should Mechanical and Electrical Engineering Courses be started till adequate instructional facilities had been provided.

47. The Council recommended that the proposal of the Regional Committee to defer for a period of three years the transfer of Diploma Course in Textile Manufacture from the Bhavnagar Polytechnic to R. C. Technical Institute, Ahmedabad be approved.

48. The Council recommended the following estimates of cost for the establishment of a polytechnic at Bombay :—

Non-recurring

	Rs.
Buildings (Plinth 87,284 sq. ft.)	11,43,000
Equipment, furniture, library and audio-visual aids	13,60,000
Office equipment and students' amenities	5,75,500
TOTAL	29,78,500

Recurring (Ceiling) 5,65,308
per annum.

Hostels for 450 students 15,10,300

The Council recommended that the Polytechnic should not increase the admissions to the Civil Engineering course beyond 120 nor, should it start Mechanical and Electrical Engineering courses till adequate instructional facilities had been provided.

49. The Council recommended an additional estimate of Rs. 15,070 for equipment for the Pooranmal Lahoti Smarak Technical College, Latur.

50. The Council recommended the following additional estimates for the Automobile Engineering Course at the Government Polytechnic, Nagpur :—

	Rs.
<i>Equipment</i>	64,000
<i>Recurring</i>	44,300
	per annum.

51. The Council recommended the following estimates of cost for the establishment of the Aurangabad College :—

	Rs.
<i>Non-recurring</i>	
Buildings (96,320 sq. ft. plinth)	13,75,000
Equipment, furniture and library	16,51,400
Office equipments and students' amenities	36,127
TOTAL	30,62,527
<i>Recurring (Ceiling)</i>	4,12,152
	per annum.
<i>Hostel for 180 students</i>	5,84,800

The Council recommended that the College should not increase admissions to Civil Engineering course beyond 60 nor should it start Mechanical and Electrical courses till adequate instructional facilities had been provided.

II. NORTHERN REGIONAL COMMITTEE

52. The Council approved the revised standards of instructional facilities for polytechnics in the Region as formulated by the Regional Committee.

53. The Council noted that the Regional Committees had considered the question of revising the model staff structure for technical institutions as recommended by the Council to suit the conditions obtaining in their respective areas and had suggested revised staff structure for each region. The Council decided that the proposals received from the Regional Committees should be co-ordinated and a detailed analysis of the regional staff structures *vis-a-vis* the Council's scheme should be prepared and placed before the Council at the next meeting.

54. The Council considered the proposal of the Northern Regional Committee regarding the appointment of a full-time lecturer in English in polytechnics. The Council was of the view that the arrangements for teaching English would have to vary from place to place to suit local conditions and therefore no uniform provision is possible for all institutions in respect of a full-time lecturer in this subject. As long as the medium of instruction is English, Polytechnics should make adequate arrangements to make good the deficiencies of students.

55. The Council understood that subsequent to the recommendations of the Regional Committee the State Government had proposed the development of all the seven sub-standard Civil Engineering Schools in the State as full-fledged polytechnics under the State Third Five Year Plan according to the standards laid down by the Council. Even after development the institutions should, however, continue as non-government institutions, but under the administrative control of Managing Committees set up by the State Government specially for the purpose in order to assure their satisfactory functioning.

56. The Council recommended the following estimates of cost for the development of Engineering Schools at Muzaffarnagar, Meerut, Ballia and Allahabad (as revised by the Regional Committee) :—

Name of the Institute	Building grant	Equipment grant	Recurring grant	Loan for hostel
	Rs.	Rs.	Rs.	Rs.
Muzaffarnagar Institute .	6,07,620	11,93,315	1,97,500	4,55,600
Meerut Polytechnic .	7,17,250	11,46,875	2,02,550	4,57,200
Allahabad School . .	4,66,715	8,94,230	2,02,550	4,52,400
Ballia Polytechnic . .	7,17,250	11,60,529	2,02,550	4,57,200

57. The Council recommended additional hostel accommodation for the Guru Nanak Engineering College, Ludhiana for 60 students at an estimated cost of Rs. 1,72,200..

58. The Council recommended an estimate of Rs. 27,000 for buildings and Rs. 17,000 for equipment for a High Voltage Laboratory in the Birla College of Engineering, Pilani.

559. The Council recommended an additional estimate of Rs. 55,000 for Library for the Mehar Chand Polytechnic, Jullundur.

60. The Council recommended an additional estimate of Rs. 8,000 for audio-visual aids for each of the Polytechnics at Chandauli, Handia and Nainital.

61. The Council recommended the following additional estimates for Draftsmanship course conducted in the Aligarh University Polytechnic :—

	Rs.
I Buildings (4,093 sq. ft. plinth)	61,400
I Recurring	13,000
	per annum.

62. The Council further recommended that the Polytechnic may increase admissions to Draftsmanship course from 40 to 60 students.

63. The Council recommended the following estimates of cost for the development of Technological Institute of Textile, Bhiwani :—

	Rs.
Buildings (18,326 sq. ft. plinth)	1,83,260
Equipment	8,50,300

64. The Council recommended the revised estimates of cost for 17 institutions (Appendix-I) as formulated by the Regional Committee as a sequel to a revision of the Regional standards.

65. The Council recommended an additional estimate of Rs. 5,000 for office equipment for the Mehar Chand Polytechnic, Jullundur.

66. The Council recommended that assistance should be provided to all technical institutions for the adoption of Metric System that involves modifications to the existing equipment or replacement of some of the components. The estimates for each institution should be worked out by the Regional Committee concerned.

III. EASTERN REGIONAL COMMITTEE

67. The Council recommended that the estimates of cost prepared by all the Regional Committees for film libraries should first be co-ordinated and a composite scheme covering all the regions should be prepared which may then be considered.

68. The Council recommended that the Regional model estimates for polytechnics as formulated by the Regional Committee be approved subject to a further examination of the staff structure and the expenditure on it.

69. The Council recommended the following estimates of cost for the development of the Berhampur Institute for conducting degree and diploma courses in Textile Technology. The Committee noted that the estimates included amounts for the improvement of facilities for diploma courses also:—

Non-recurring

	Rs.
(i) Accommodation (60,000 sq. ft. Rs. 15 per sq. ft.)	9.00 lacs.
(ii) Humidification Plant	0.50 lacs.
(iii) Equipment, Library & Furniture	5.50 lacs.
TOTAL	15.00 lacs.
<i>Recurring (Net deficit)</i>	2.05 lacs.
<i>Hostel (90 students)</i>	2.83 lacs.

70. The Council requested the Regional Committee to furnish revised estimates for the Bolangir Polytechnic on the basis of revised standards now laid down for diploma institutions.

IV. SOUTHERN REGIONAL COMMITTEE

71. The Council accepted the view of the Co-ordinating Committee that the establishment of technical institutions for girls should not be held up due to lack of women teachers. With the starting of these institutions, an adequate number of women teachers will become available for new institutions in due course.

72. The Council considered the point raised by the Regional Committee whether the proposals made by certain institutions in the Region regarding Management Studies should be dealt with directly between the Ministry and the institutions or they should be first considered by the Regional Committee in consultation with the State Governments concerned. The Council pointed out that according to the functions assigned to different Boards and Committees, development of Management Studies fell within the purview of the Board of Management Studies. The Council also noted that the proposals received from the institutions were

under the consideration of the Board and were not being settled between the Ministry and the institutions.

73. The Council accepted the following recommendations of the Regional Committee in respect of admissions to technical institutions:—

- (a) There should be no reservation of seats on district-wise or region-wise basis.
- (b) Children of Central Government employees, employees of private and public enterprises though not residents of a particular state, should be admitted on the basis of merit to technical institutions in the State.
- (c) Students belonging to Scheduled Castes and Scheduled Tribes to be admitted against the seats reserved for them should have at least 90 per cent of the total marks secured by the last candidate admitted against general seats.
- (d) The upper age limit of 21 may be relaxed in deserving cases.
- (e) In view of the fact that the interview method has not been well established, nor correctly standardised, the interview marks should not exceed 15% of the total.

74. The Council recommended that the maintenance expenditure should continue as at present *viz.* Rs. 100 per student per year.

75. The Council approved the Regional standards of instructional facilities formulated by the Southern Regional Committee for polytechnics and engineering colleges subject to a further examination of the staff structure and expenditure on it.

76. The Council recommended loans for hostels for the following four institutions:—

	Rs.
(a) Government Polytechnic, Belgaum .	4.52 lacs.
(b) Government Polytechnic, Karwar .	4.52 lacs.
(c) Government Polytechnic, Chickmagalur	4.52 lacs.
(d) B.V.B. College of Engineering, Hubli	3.74 lacs.

77. As regards N.S.S. Polytechnic Pandalam, the Council recommended that in accordance with the normal

standards prescribed by it, additional hostel accommodation be provided for 60 students at an estimated cost of Rs. 1.53 lakhs and the question of providing further accommodation for 60 more students be re-examined by the Regional Committee in the light of the conditions obtaining at Pandalam.

78. The Council recommended the following additional estimates of cost for furniture for seven institutions as shown below:—

	Rs.
(a) Annamalai Polytechnic, Chettinad	27,600
(b) A.M.M. Polytechnic, Avadi	27,600
(c) Alagappa Polytechnic, Karaikudi	14,700
(d) D.A.C.G. Polytechnic, Chickmangalur	14,800
(e) Nachimuthu Polytechnic, Pollachi	27,600
(f) Seshasayee Institute of Technology, Tiruchirappalli	16,255
(g) M.V.M. Polytechnic, Tanuku	27,600

79. The Council recommended the following estimates of cost for the establishment of the Srikakulam Polytechnic:—

Non-recurring

	Rs.
Buildings (54,200 sq. ft.)	7,86,240
Equipment, Library and Furniture including Office equipment	13,75,957

TOTAL 21,62,197

Recurring

Salaries and maintenance	3,95,000 pr annum.
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80. The Council noted that the Andhra Pradesh Government desired to start two technical institutions for girls that would offer courses in three fields. The Regional Committee on the other hand, had recommended that the institutions should be established strictly in accordance with the draft scheme prepared by the Central Government offering courses in six subjects. The Council decided that the Regional Committee should discuss the matter in detail with the State Government with a view to determining the particular fields of occupational importance for the students of Andhra Pradesh which may be offered at these institutions. The State Government should prepare in consultation with the Regional Committee a detailed scheme together with

estimates of cost. The revised scheme may be submitted to the Council for consideration.

81. The Council recommended loans for the construction of hostels for two institutions as shown below:—

Name of Institution	Annual admissions	No. of students for whom hostel accommodation has been recommended	Amount of loan
			Rs.
Malnad College of Engineering, Bhaan	120	204	5.00 lakhs
Srinivasa Subbaya Polytechnic, Sijrali	120	180	4.52 „

82. The Council recommended that an amount of Rs. 19,200 be sanctioned for furniture for the Madras Institute of Technology, Madras from out of the savings in the Building grant.

ITEM No. 48.—To consider the question of scales of fees to be prescribed for Technical Institutions

83. While agreeing with the recommendations of the Co-ordinating Committee that the scale of fee should be generally prescribed in such a way that the income from this source would cover 25% of the gross expenditure of an institution on instructional items, the Council was of the view that no institution should be wholly dependent on student's fee and grants from the Centre/States but should itself make at least a certain minimum contribution. The Council recommended that this matter be examined further in detail.

84. The Council noted that in certain institutions, a separate fee was being charged for laboratory and other instructional purposes in addition to tuition fees. The Council recommended that laboratory and other fees for instructional purposes should be an integral part of the tuition fees and not charged as separate items.

85. As regards other fees like games, library, extra curricular activities etc. each Regional Committee may suggest a suitable scale in the light of the conditions obtaining in different States.

86. The Council also recommended that in the interests of students, tuition fees should be collected in not less than three instalments in a year.

ITEM NO. 9.—To receive a note on the decisions reached at the conference of Chief Ministers on various aspects of Technical Education

87. The Council endorsed the recommendations made at the Chief Ministers' Conference on 15th January, 1961.

ITEM NO. 10.—To receive a note on the Administrative Staff College, Hyderabad

88. The Council received a note on the Administrative Staff College and decided to record it.

ITEM NO. 11.—To consider the question of expansion of facilities in Town Planning

89. The Council noted that several States had not yet furnished information regarding their requirements for Town Planners during the Fourth Plan period. The Council therefore decided that the entire question of expansion of facilities in this field should be reconsidered by the Architecture Board after obtaining up-to-date and complete information from all States.

ITEM NO. 12.—To report on the establishment of two All India Institutes of Management at Calcutta and Ahmedabad

90. The Council noted the decision of the Central Government to establish two Institutes of Management, one at Calcutta and another at Ahmedabad with the assistance promised by the Ford Foundation.

91. The Council was of the view that the scope of work of these Institutes should be co-ordinated with the programmes of Management Studies already implemented on the recommendations of the Board of Management Studies. For this purpose, the Council recommended that the Planning Committees set up for the Institutes may each include a

representative of the Council. The Council also recommended that the detailed plans prepared by the Planning Committees for the Institutes may also be placed before the Council.

ITEM NO. 13.—To consider the question of the number of attempts to be allowed to a candidate to pass the First Year Examination of Engineering/Technological Courses

92. The Council noted that on the basis of the information furnished by the institution, the failures in the first attempt were large in a number of institutions. Most of them, however, cleared the examinations in the next attempt. Nevertheless, there is room for improvement by admitting students of a better calibre and also by improving the instructional facilities specially in respect of staff. The Council recommended that in order to obtain a complete picture of the position, the relationship between the examination results to the calibre of students admitted should be studied in detail.

93. The Council reiterated its earlier decision that no student should be allowed to continue to study in the first year class of his course beyond two years, nor, should he be allowed to appear at more than three examinations including supplementary examinations, if any. In so far as the Higher Technological Institutes are concerned, the question of whether a particular student who had failed at an examination should be allowed to repeat the course may be left to the decision of the Institutes concerned.

ITEM NO. 14.—To consider the report of the expert Committees on Pedagogical Training of Technical Teachers of multipurpose schools

94. The Council decided that the scheme of Pedagogical Training of Technical Teachers of Multipurpose Schools prepared by the Expert Committee be forwarded to the Ministry of Education and the All India Council for Secondary Education for implementation.

ITEM NO. 15.—To consider the question of revising the estimates of cost of cycle-sheds for Technical Institutions

95. The Council accepted the recommendations of its Co-ordinating Committee and decided that the cost of construction of cycle sheds for individual institutions may be examined by the Regional Committees concerned and if

any increase in the present estimate of Rs. 20 per cycle was required, that may be agreed to up to a limit of Rs. 40 per cycle.

ITEM NO. 16.—To receive a note on the implementation of revised salary scales of Teachers of Technical Institutions

96. The Council decided that technical institutions need not be grouped into Class 'A' and Class 'B' as envisaged in the original scheme of improvement of salary scales, but each institution should be permitted to offer either Class 'A' scales or Class 'B' scales to Principals and Professors depending upon the qualifications and experience of the individuals concerned and the scope of work carried out by them. Class 'A' scales should be sanctioned only for those teachers who possess research qualifications or experience and are engaged in post-graduate teaching or in research.

97. As regards the implementations of the revised salary scales by the State Governments, the Council expressed serious concern over the delay and urged that in the interest of technical education, the scheme should be implemented with a sense of urgency by the States.

98. The Council noted that the Governments of Kerala and Madras had not only not accepted the scheme but also had changed the staff structure of technical institutions in order to fit into their own revised salary scales. The Council requested these two States to accept the scheme without any modification. The representative of the Government of Madras stated that the scheme was under the consideration of the State Government.

ITEM NO. 17.—To consider the scheme for the establishment of a Central School of Printing

99. The Council approved the scheme of establishment of a Central School of Printing as formulated by the Applied Art Board and recommended that the School be established during the Third Plan period.

ITEM NO. 18.—To consider the present position regarding admission of students to Polytechnics

100. The Council expressed serious concern over the unsatisfactory position in respect of the calibre of students admitted to Polytechnics. Not only are students of a decidedly inferior quality admitted generally to a large

number of institutions but in a number of cases, the seats available were not being filled up. The Council decided that a detailed investigation into the question of admissions to Polytechnics in relation to various factors, as for instance location of the institutions, occupational interests of students in different States, etc., should be carried out as a research project and on the basis of this investigation, the future policy regarding the starting of new institutions as also the most effective way of utilising the existing facilities should be formulated. This research project should be carried out through a suitable agency specially selected for the purpose.

101. The Council recommended that the State Governments should decide the location of new institutions in the Third Five Year Plan in consultation with the Regional Committees in order to assure satisfactory functioning of the institutions.

ITEM No. 19.—To consider the proposals received from the State Governments and the Ministries and Departments of the Government regarding various aspects of Technical Education.

102. The Council was of the view that since Junior Technical Schools have a character of their own and are designed specifically to provide technical education and training to boys in the age group 14-17, it would not be correct to affiliate the schools to the National Council for Vocational Trades or to prepare the students for the examinations held by that Council. The Council, therefore, recommended that the State Boards of Technical Education should conduct the examinations for the Junior Technical Schools, and wherever possible, the examiners for the trades be the same as those appointed by the National Council for Vocational Trades for its own examinations. The examinations in the trades may also be conducted in accordance with the standards prescribed by the National Council.

103. The Council also recommended that steps should be taken to secure recognition for the Junior Technical School Certificates for the purpose of employment in industry.

104. The Council recommended that in view of increased costs, the furniture estimates for a hostel seat should be revised to Rs. 200 for degree course students and Rs. 150 for diploma course students.

105. The Council decided that the question of whether an additional centre should be sanctioned for diploma

course in Textile Technology in Kerala should be examined by the Southern Regional Committee. Further action should be taken on the basis of the recommendations of the Regional Committee.

106. The Council noted with serious concern that sufficient foreign exchange was not being allocated for technical institutions in order to equip their laboratories and workshops according to the prescribed standards. As a result a large number of institutions that have already started functioning and have admitted students are finding it extremely difficult to maintain correct standards. Since technical education and training are directly related to economic development in industrial and other sectors, any lowering of standards due to lack of equipment could have serious repercussions on the developmental programmes. The Council, therefore, urged that the Central Government should make adequate foreign exchange available. If, due to any reasons the foreign exchange position continued to be as unsatisfactory as at present, no new institutions should be started till the existing ones had been properly equipped.

107. The Council expressed the hope that Gujarat, Maharashtra and Uttar Pradesh would also accept the new system of Secondary Education and reorganise the degree courses in engineering into five-year integrated courses as in other parts of the country.

108. The Council accepted the recommendations of its Co-ordinating Committee that guided reading and reference work should be included in the curriculum of engineering courses and sessional marks should be allotted for the purpose.

109. As regards hostels, the Council decided that the question of providing hostel accommodation for more than 50% students in a particular institution should be considered by the Regional Committee concerned on the merits of the case. The question of sanctioning additional hostels for the institutions should be considered on the basis of the recommendations of the Regional Committees.

110. As regards purchase of equipment, the Council noted that the State Government could, if they so wished, authorise their Directors of Technical Education as the Indenting Officers on the Directorate General of Supplies and Disposals.

111. The Council recommended that assistance from the Central Government for the recurring expenditure to an institution should be for a period of five years from the date of starting of the institution and after that period the Central Government's responsibility for recurring grants should cease. The Council reiterated its earlier recommendation that the State Governments should formulate and adopt a grant-in-aid Code that would assure the satisfactory functioning of non-government institutions after the Central Government assistance ceased.

ITEM No. 20.—To consider the report of the special Committee for Commerce Education

112. The Council decided that the report should be circulated to Universities, State Governments, Ministries of the Central Government and other authorities concerned with Commerce Education for their comments on the various recommendations made by the Committee. The report together with the comments received should be examined by the Co-ordinating Committee which may formulate detailed proposals for the implementation of the report.

ITEM No. 21.—To consider the question of reservation of seats for ex-State Students in Technical Institutions

113. The Council pointed out that the main intention of its earlier recommendations for the admission of ex-State students to technical institutions was not to reserve a definite percentage of seats in the institutions exclusively for ex-State students, but to remove the existing barriers to their admission in the form of nativity, residence in the State, the University or State Board from which the qualifying examination has been passed etc. The Council, therefore, recommended that the State Governments be requested to reconsider the matter in the light of this clarification and agree to remove all the existing restrictions on the admission of ex-State students to technical institutions.

ITEM No. 22.—To receive a note on the Third Five Year Plan of Technical Education

114. The Council received the report.

115. The Council noted with regret that the Central scheme of construction of staff quarters has had to be dropped

as a sequel to a reduction in the Plan allocation for the Central sector. The provision for staff quarters, however, is a very important measure as otherwise it would be extremely difficult for a majority of technical institutions to recruit suitable staff. Therefore, the choice is between the establishment of new institutions and improvement of the existing ones by providing staff quarters and other facilities. The Council, therefore, recommended that the State Governments may be informed that if they so wished, they could divert the provision made for the establishment of new institutions in their Plans to the construction of staff quarters for the existing ones. Further, the expenditure incurred on staff quarters should be regarded as an admissible item for the purpose of Central assistance.

116. As regards technical institutions for girls, the Council recommended that while 24 institutions may be established as provided for in the State Plans, the scheme formulated for such institutions should be examined in detail by the Regional Committees with a view to suggesting modifications/improvements, if any, in the light of the comments received from the State Governments. The Council also expressed the view that these technical institutions may train girls for the Second and Third Cycles relating to age groups 14+ and 16+ and the question of training girls for the primary cycle *viz.* in the age group 11+ be deferred for the present.

117. The representative of the Ministry of Commerce & Industry raised the question of the establishment of a Central Institute for Training in Foundry and Forge Technology. He stated that in addition to the Ranchi Project, another large foundry project was proposed to be established elsewhere in the country in the public sector during the Third Plan period. For these new projects as also for the expansion of the existing industry, large numbers of technical personnel specially trained in foundry and forge technology were required. He suggested that the capacity of the proposed Foundry Institute should be reconsidered in the light of these developments and the Institute be established as soon as possible. The Council accepted the suggestion and decided that the Expert Committee be requested to finalise the scheme on the basis of the latest information available regarding the scope of development of foundry industry and the Central Government should take early steps to establish the Institute.

ITEM NO. 23.—To report the appointment of a working group of the Council for formulating a scheme for Training of Technical Teachers with Diploma qualification for Polytechnics

118. The Council endorsed the decision of the Chairman regarding the appointment of a Working Group for the training of teachers for Polytechnics.

ITEM NO. 24.—To consider the recommendations of the Fourth meeting of the Pharmaceutical Education Committee held on 17th June, 1961

119. The Council approved the scheme of four-year integrated B. Pharm. degree course together with the model list of accommodation, equipment and staff formulated by the Pharmaceutical Education Committee. The Council decided that the scheme be circulated to all universities and other institutions for their comments/suggestions, if any, and for implementation.

120. The Council decided that the reports of the Visiting Committees on the Department of Pharmacy, Nagpur University; Department of Pharmacy, Sagar University; Department of Pharmacy, Birla College, Pilani; Department of Pharmacy, Punjab University, Department of Pharmacy, Maharaja's College, Ernakulam; and L. M. College of Pharmacy, Ahmedabad; be forwarded to the universities/institutions concerned together with the scheme of four-year B. Pharm. course; and that the universities/institutions be asked to formulate detailed proposals together with estimates of cost for the introduction of the new course. The proposals when received should be considered by the Pharmaceutical Education Committee which should make recommendations regarding the financial assistance to be given to the universities/institutions.

121. The Council decided that the scheme of four-year B. Pharm. degree course be forwarded to the Banaras Hindu University and Government of Bihar which may be asked to formulate detailed proposals for the introduction of the scheme. The detailed proposals when received from the university/State Government should be considered by the Pharmaceutical Education Committee which should make recommendations regarding the estimates of cost and other details. It was also decided that the Government of Bihar be requested to consider the question of starting a Department of Pharmacy in an existing technical institution in the

State or in the University instead of developing a separate Institute of Pharmacy at Patna.

122. The Council approved the recommendations of the Pharmaceutical Education Committee that facilities for B. Pharm. degree course be developed in Jammu & Kashmir State and for this purpose, a Department of Pharmacy be established either in the Jammu & Kashmir University or in a suitable technical institution in the State. The Council also decided that the State Government be requested to prepare a detailed scheme for the consideration of the Pharmaceutical Education Committee.

ADDENDUM TO ITEM NO. 7.—**To consider the report of the Standing Committee of the Eastern Regional Committee on the progress of institutions in the Region**

123. The Council expressed serious concern over the present unsatisfactory state of technical institutions in the region and decided that the Eastern Regional Committee should examine the report of the Standing Committee in consultation with the State Governments and formulate specific measures for the improvement of the institutions. The Council also decided that the Chairman may take up this matter with the Chief Ministers of the States concerned.

124. The meeting terminated with a vote of thanks to the Chair.

APPENDIX I

*Statement of cost of 17 institutions as formulated by the Northern Regional Committee
as a sequel to a revision of the Regional Standards.*

Particulars of the scheme	Building grant		Equipment grant		Recurring grant		Remarks
	Previous recom- menda- tion	Revised recom- menda- tion	Previous recom- menda- tion	Revised recom- menda- tion	Previous recom- menda- tion	Revised recom- menda- tion	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
<i>Uttar Pradesh</i>							
1. Establishment of a big size Polytechnic at Kanpur with an intake of 240.	12,05,400	10,82,500	13,90,250	15,78,100	5,36,050	4,58,200	
2. Establishment of a Polytechnic at Faizabad.	8,17,005	7,17,250	8,85,200	12,28,500	3,09,200	2,88,950	
3. Establishment of a Polytechnic at Mirzapur.	8,17,005	7,17,250	8,85,200	12,28,500	3,09,200	2,88,950	
4. Development of Murlidhar Gajanand Polytechnic, Hathras.	..	..	8,79,590	12,22,890	..	..	No change in the building grant and recurring grant is necessary.

APPENDIX I—Contd.

1	2	3	4	5	6	7	8
<i>Uttar Pradesh—contd.</i>							
5. Establishment of Seth Ganga Sagar Jatiya Technical Institute, Khurja.	8,85,200	12,28,500	..	..	No change in the building grant and recurring grant is necessary.
6. Introduction of diploma courses in Electrical and Civil Engineering at the P.M.V. Technical Institute, Nathura.	4,30,500	6,18,700	..	..	Ditto
7. Introduction of Electrical & Mechanical Engineering courses at the Hewett Polytechnic, Lucknow.	5,43,500	8,42,800	..	..	Ditto.
8. Introduction of Electrical & Mechanical Engineering courses at the Hindu Education Society Polytechnic, Lucknow.	5,43,500	8,12,800	..	..	Ditto.

Punjab

1. Establishment of a Polytechnic at Sirsa.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
2. Establishment of a Polytechnic at Batala.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
3. Establishment of a Polytechnic at Guru Tegh Bahadur Garh.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
4. Establishment of a Polytechnic at Jhajjar.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750

Rajasthan

1. Establishment of a new Polytechnic at Kotah.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050
2. Establishment of a new Polytechnic at Alwar.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050
3. Establishment of a new Polytechnic at Bikaner.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050
4. Introduction of Electrical and Mech. Engineering courses at the Ajmer Polytechnic, Ajmer.	8,17,005	7,17,250	5,43,515	8,42,800	2,63,300	2,43,050

Himachal Pradesh

1. Establishment of a Government Polytechnic at Sundernagar (Mandi).	8,17,005	7,17,250	8,85,200	12,28,500	2,31,440	2,11,190
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ANNEXURE I

Inaugural Address delivered by Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs at New Delhi on 7th July, 1962

FRIENDS,

I have great pleasure in welcoming you to this the 14th meeting of the All India Council for Technical Education. These annual meetings of the Council provide (to the Central Government, State Governments universities and technical institutions) an opportunity to assess the progress made in technical education and to formulate future policies and programmes. This meeting today is of particular importance as the Third Five Year Plan has been finalised and is ready for submission to Parliament. Our task is to ensure expansion of facilities for Technical Education in order to fulfil the requirements of the Plan. In carrying out this task, we cannot limit ourselves to the present needs. We should take a long range view of the industrialisation of the country and the training of the correct type of technical personnel in order to accelerate it. The rapid advances in sciences and technology that are taking place have their impact on our society. Ideas, beliefs and values are changing. We should, therefore, plan for a system of technical education that is both vigorous and capable of meeting the challenge of new situations that can be but dimly visualised today.

At our last meeting held in April, 1960, I gave an account of the progress of technical education during the first four years of the Second Plan. A detailed report has been placed before you on the progress made up to the end of the Plan period. I will, therefore, refer at this stage only to those changes which have taken place since we last met and record the progress over the entire Plan period. The Indian Institute of Technology, Kanpur, the last in the chain of four Higher Technological Institutes planned by the Council in 1946 started functioning in July 1960, when the first batch of students was admitted to degree courses in engineering and technology. The U.S.A. is assisting in the establishment and development of the Institute, by providing equipment and expert professors in various fields. The Bombay Institute has moved to its own buildings at Powai where the progress of construction has been quite

satisfactory. The Madras Institute also has shifted part of its activities to its buildings now under construction at Guindy. With the starting of these Institutes, we have fulfilled the original recommendation of the Council and our task now is to develop them as the main centres of advanced technological education and research in the country.

I have on previous occasions mentioned how the targets for degree and diploma courses in the Second Five Year Plan had to be revised from time to time throughout the Plan period. The position as it stood at the end of the Second Plan period is that the number of institutions for first degree courses increased to 100 and that for diploma courses to 196. The admission capacity of the institutions also increased to over 13,850 students for degree courses and 25,750 students for diploma courses. The State Plans were revised correspondingly and provision was finally made for the establishment of 10 engineering colleges and 52 polytechnics (including those sanctioned under the Centrally-Sponsored Scheme). By the end of the Plan period all the engineering colleges and 44 polytechnics were established. The remaining eight polytechnics are in process of establishment and are expected to start this year or the next. Under the Centrally Sponsored Scheme of Regional Engineering Colleges, we sanctioned eight colleges. The first Regional College started at Warangal in 1960. During 1960-61, six other colleges were established at Mangalore, Durgapur, Jamshedpur, Nagpur, Bhopal and Srinagar. The eighth Regional College is expected to start in July/August this year at Allahabad. Our 'Open Door' policy in respect of private enterprise gave a great impetus to the expansion of technical education in the country. Under this policy, the Council recommended eight colleges and 23 polytechnics, all of which have started functioning. Two more colleges, have been approved, of which one has already started and another is expected to do so in Bombay in the course of this year.

I shall now relate these developments to the targets envisaged under the Third Plan. On the recommendations of the Central Working Group, the Planning Commission has suggested 5,000 additional seats for full-time degree courses and 10,000 seats for diploma courses by the end of the Third Plan period. After a detailed discussion of the State Plans, it was decided that this target should be reached partly by the establishment of new institutions and partly by the expansion of existing ones, wherever possible.

As regards new institutions, it has been agreed that there should be seven more Regional Colleges to be established in Gujarat, Kerala, Orissa, Rajasthan, Punjab, Assam and Madras. With the establishment of these new institutions, each State will have a Regional College. In view, however, of the revised financial allocation for the Central Plan to which I shall refer later, we propose to establish the new Regional Colleges in a phased manner over the Plan period. Sanction has been given for the starting of the Regional Colleges in Gujarat and Kerala in the current year. The new College of Engineering and Technology in Delhi will also start this year. In the States' sector, provision has been made for the establishment of 10 additional engineering colleges during the Plan period. A tentative plan has also been drawn up for the expansion of existing institutions and the Regional Committees will now examine the case of each institution and decide how best the facilities there could be expanded for additional admissions.

As regards polytechnics, provision has been made in the States' sector for the establishment of 67 additional institutions. When all these new institutions, have started functioning and the existing ones expanded, the admission capacity will increase to 19,130 students for degree courses and 37,390 students for diploma courses by the end of the Plan period, but I have no doubt in my mind that the provision for diploma courses will have to be considerably expanded to meet the growing needs of the country. Even the present targets represent a six-fold increase at the degree level and a ten-fold increase at the diploma level as compared to the position in 1947.

These are impressive numbers specially for a country like ours that has had to build from scratch within a short time. But numbers are not everything. What of quality? The crux of the problem of standards in technical education is three-fold—Teachers, Equipment and Buildings. On the recommendations of the Council, efforts are being made to provide at all our institutions the instructional facilities necessary for maintaining proper standards of education. In view of the complexity of the problem, the position is still not satisfactory. There is the difficulty of foreign exchange, due to which our institutions are unable to obtain all the equipment needed by them. There is no indication that the foreign exchange position will improve during the Third Plan period. Therefore, our institutions should make

every effort to produce as many items as possible within their own workshops and reduce their dependence upon imports. The indigenous scientific instruments industry should also develop, as continued dependence on imports from abroad will only lead to more difficult situations in the future. Similar difficulties are also being experienced in respect of buildings. The cost of construction is going up every day and the estimates of technical institutions have had to be revised continuously. With the limited funds available in the Third Plan for the expansion of Technical Education it has become imperative that we should economise on buildings. The practice of constructing buildings in the traditional style and on a grandiose scale replete with architectural embellishments will have to be given up and only functional and economically-designed buildings should be constructed.

In the order of priorities I have deliberately given the first place to Teachers. It is the quality of staff that ultimately makes for the success of our institutions. While the shortage of teachers continues as before, the measures suggested by the Central Government and the Council have not yet been fully implemented by the States, and as a result, the situation is becoming even more difficult. I am referring in particular to the improvement of salary scales of teachers. Although the scheme was sanctioned in 1959, only four States have accepted and implemented it. The rest have taken no final decision in the matter. I feel that this is a very important question and must be settled immediately. Unless we can assure that the existing institutions are adequately staffed, it would be futile and perhaps harmful to expand facilities for technical education at the present accelerated rate. Yet it is true the present state of development in the country demands that the programme of expansion of technical education must not only be maintained, but increased. I would, therefore, reiterate my plea that all State Governments who have not yet implemented the scheme, should do so without any further delay. I am happy to note that the University Grants Commission has approved for university institutions the scheme of improved salary scales formulated by the Council.

The Co-ordinating Committee has considered the problem of shortage of staff in detail, and suggested various measures that deserve your very careful consideration. A detailed note has been placed before you at this meeting. The Committee has suggested that if in a particular State the

staff position at the existing institutions is unsatisfactory, no new institution should be established till the position has improved. Otherwise, we would be laying ourselves open to the charge of deliberately bringing down the standards. I for one do not see how new technical institutions can be started when the existing institutions are so inadequately staffed. Multiplying the institutions will only create more difficult situations. Every State should, therefore, organise immediately teacher-training programmes not only to staff the existing institutions but to provide teachers to new ones to be established during the current plan period.

Another important aspect of standards of technical education is the calibre of students admitted to our technical institutions. While the position in respect of engineering colleges is generally satisfactory and students are being admitted on a competitive basis, the same cannot be said of our polytechnics. A detailed study of the admissions made to polytechnics has been carried out by the Ministry with the assistance of the Regional Offices and a note has been placed before you at this meeting. The position revealed by the study gives us cause for concern. In view of the expansion of facilities for degree courses on a large scale, better students are joining engineering colleges and there has been a fall in the standard of students in polytechnics. The position will become still more difficult when secondary education in the country is fully reorganised. The minimum admission qualification for the five-year integrated degree course and for the polytechnic diploma course will be the same *viz.* Higher Secondary Examination. At that stage, the polytechnics will find it difficult to attract good students. Admission of students of poor quality means a larger wastage in the institutions and also falling standards. In the circumstances, the problem of how best to attract better types of students for diploma courses should be considered by the Council.

The study carried out by the Ministry also reveals that the location of some of the institutions is unsatisfactory. As a result, a large proportion of seats in some institutions has remained unutilised. It means that the facilities for technical education provided at these places, after spending considerable sums, are not being put to the best possible use. While our endeavour should be to disperse technical institutions as widely as possible, we should not ignore the fact that an institution located in an unsatisfactory place will

fail to attract good students. This will defeat the purpose for which it has been set up and I hope that State Governments will consult the Regional Committees before deciding the location of new institution.

I would suggest to the Council that the entire question of diploma courses, their aims and objects, contents of training, standards etc., should be reconsidered. That is all the more necessary in view of the changing pattern of technical personnel in industry and other sectors. Some experts have pointed out that our diploma courses are not serving the real purpose of training supervisory personnel for industry ; they are only a diluted version of our degree courses and lack the practical content and functional approach necessary for the training of technicians. I would, therefore, request the Council to examine this matter and suggest how our poly-technic education should be reorganised.

I shall now revert to the Third Five Year Plan and the financial provision required to implement our new programmes. The targets at the degree and diploma level that I have already indicated and the schemes formulated to reach them are only one aspect. The other aspects include the qualitative improvement of technical education at all levels and the diversification of fields of study. For this purpose, schemes have been formulated for the establishment of several specialised institutions as for instance, Institutes of Management, a Central School of Printing, a National Institute for Training in Industrial Engineering and a National Institute for Foundry and Forge Technology. Facilities for part-time courses would be expanded and at least 25 per cent of our technical students will benefit by scholarships. After detailed discussions with the Planning Commission, we estimated a minimum outlay of Rs. 86.6 crores for the Central Plan. For the Plans in the States' sector a provision of Rs. 71.3 crores has been agreed to by the Planning Commission. The Planning Commission has now indicated for the Central Plan a 'programme limit' of Rs. 70 crores. This reduction in provision would require drastic revision of schemes specially in respect of phasing. It would mean that many proposed new institutions will have to be started in the latter half of the Plan period, and scholarships for technical students, a much-needed measure, reduced. The construction of staff quarters, a recommendation made by the Council quite some time ago, may have to be dropped.

I have referred earlier to the role played by private enterprise in the expansion of technical education during the Second Plan period. A large number of engineering colleges and polytechnics have been established by various private agencies and the Central Government and State Governments are giving them financial assistance. The question of whether our "Open Door Policy" should continue was considered at a conference of Chief Ministers held in January last. It was agreed that private enterprise should be encouraged to play its due role also in the Third Plan, but in view of the progress already attained and in order to check any unbalanced growth, a more selective approach should be adopted in the choice of institutions. For this purpose, we have proposed that in the case of new colleges to be established, at least 50 per cent of the non-recurring expenditure should be contributed by the private agencies concerned. The other 50 per cent will be provided by the Central Government and the State Governments in equal parts. The Central Government would also contribute 25 per cent of the recurring expenditure; the balance should be provided by the private agencies and State Governments. As regards polytechnics, a more liberal contribution by the Central Government has been proposed. 40 per cent. of both non-recurring and recurring expenditure would be provided by the Central Government provided that the balance of 60 per cent is borne by the private agencies and the State Governments.

There is the question of a common admission examination which has been discussed several times but still remains to be settled. The Council had recommended that in the interest of uniformity of standards as also in the interest of students, admission to technical institutions should be regulated on the basis of an admission test held specially for the purpose. As a first step towards rationalisation of admissions we decided to hold from this year a common admission examination for all four Higher Technological Institutes and I hope that this examination held on an all-India basis will be gradually extended to the Regional Colleges. As regards institutions in the States, the matter was considered by the Co-ordinating Committee and also at the conference of Chief Ministers in January last. The consensus was that each State should adopt uniform measures for its own institutions with possibly a common admission test. I consider this a promising development and hope that the State Governments would implement it without delay.

You will remember that on the recommendations of the Council, a Special Committee was set up under the Chairmanship of Dr. V. K. R. V. Rao to enquire into the present state of Commerce Education in the country and to recommend the lines along which Commerce Education should be reorganised and developed. I am glad that the Committee has completed its labours and its report is now placed before the Council. Without anticipating your discussions I would say that the Committee has produced a very valuable report on this important subject and its recommendations for the reorganisation of Commerce Education should receive your full consideration. I wish to thank Dr. Rao and the members of his Committee for their valuable work.

I must not take any more of your time, but before I conclude I must once again pay my tribute to the Council for its valuable contribution to the development of technical education in the country. Without the devoted work of the Council and its many Committees, the phenomenal expansion of technical education that has taken place, would not have been possible. The members of the Council and its Boards of Studies, Regional Committees, Visiting Committees etc., have not only advised us with regard to specific schemes placed before them, but have initiated many innovations for improving the quality of technical education. On behalf of the Council and on my behalf I must also thank all experts who have served on our Committees and Boards and given freely their time, thought and energy in the cause of technical education.

I extend to you once again my warm welcome and request you to take up consideration of the Agenda.

ANNEXURE II

All India Council for Technical Education

14th MEETING

DATE : 7th July, 1961. PLACE : Commission Room 'G',
Vigyan Bhavan, Maulana Azad
TIME : 10.00 A.M. Road, New Delhi.

A G E N D A

*Item
No.*

1. To confirm the minutes of the 13th meeting of the Council.
2. To report the present membership of the Council.
3. To report on the action taken on the recommendations/decisions of the Council made at the 13th meeting.
4. To report on the important decisions taken by the Co-ordinating Committee since the last meeting of the Council.
5. To report on the progress of schemes of Technical Education included in the Second Plan.
6. The All India Boards of Technical studies :
 - (a) Matters for report
 - (b) Matters for decision.
7. The Regional Committees :
 - (a) Matters for report.
 - (b) Matters for decision.
8. To consider the question of Scales of Fees to be prescribed for technical institutions.
9. To receive a note on the decisions reached at the Conference of Chief Ministers on various aspects of technical education.
10. To receive a note on the Administrative Staff College, Hyderabad.

*Item
No.*

11. To consider the question of expansion of facilities in Town Planning.
12. To report on the establishment of two All India Institutes of Management at Calcutta and Ahmedabad.
13. To consider the question of the number of attempts to be allowed to a candidate to pass the first-year examination of engineering/technological courses.
14. To consider the report of the Expert Committee on Pedagogical Training of Technical Teachers of Multipurpose Schools.
15. To consider the question of revising the estimates of cost of cycle sheds for technical institutions.
16. To receive a note on the implementation of revised salary scales of teachers of technical institutions.
17. To consider a scheme for the establishment of a Central School of Printing.
18. To consider the present position regarding admission of students to Polytechnics.
19. To consider the proposals received from the State Governments and the Ministries and Departments of the Government regarding various aspects of Technical Education.
20. To consider the report of the Special Committee for Commerce Education.
21. To consider a question of reservation of seats for *ex-State* students in Technical Institutions.
22. To receive a note on the Third Five Year Plan of Technical Education.
23. To report the appointment of a Working Group of the Council for formulating a Scheme for training of technical teachers with diploma qualifications for Polytechnics.
24. To consider the recommendations of the fourth meeting of the Pharmaceutical Education Committee held on 17th June, 1961.

ANNEXURES TO AGENDA

- Annexure I to item No. 2.
 Annexure II to item No. 4.
 Annexures III & IV to item No. 5.
 Annexure V to item No. 6.
 Annexure VI to item No. 10.
 Annexure VII to item No. 11.
 Annexure VIII to item No. 13.
 Annexure IX to item No. 14.
 Annexure X to item No. 15.
 Annexure XI to item No. 16.
 Annexure XII to item No. 17.
 Annexure XIII to item No. 19.
 Annexures XIV & XV to item No. 22.
 Annexure XVI to item No. 24.
 Annexure XVII to item No. 7.

ITEM NO. 1.—To confirm the minutes of the 13th meeting of the Council

The minutes of the 13th meeting of the All India Council for Technical Education held on the 30th April, 1960 were circulated to the members. In the light of the comments received, the following amendments were approved by the Chairman.

ITEM No.—8 (last para)

“The Council strongly recommended the continuance of the financial support to the Administrative Staff College at Hyderabad with an annual recurring grant or subscription. The Council was not in a position to make specific recommendations regarding the amount which should be paid annually and desired that this should be decided after a scrutiny of the full details pertaining to the running of the College. The Council further desired that a comprehensive note on this college and its working should be placed before it at the next meeting.”

ITEM NO. 14.—Northern Regional Committee

Conversion of Ceremonial halls into Drawing halls

“The Council approved the recommendations of the Regional Committee that the Ceremonial Hall constructed at the Government Technical Institute, Gorakhpur may be converted into Drawing Hall by providing wooden partition at the cost of the State Government and the expenditure incurred at the Hall may be regarded as admissible item under the developmental programme for Central grants.

As regards the Government Textile Institute, Kanpur, the Council recommended that the Ceremonial Hall may continue as a regular auditorium and the State Government may construct a separate Dye House for the Institute at their own cost.”

The amendments were circulated to all the members of the Council. As no further comments have been received from the members, the proceedings as now amended may be deemed to have been confirmed by circulation.

ITEM NO. 2.—To report the membership of the re-constituted Council

In accordance with the constitution of the All India Council for Technical Education, the term of office of the members of the Council expired on the 29th April, 1961. The Council has been reconstituted for a further period of three years with effect from the 30th April, 1961. The constitution of the Council has also been amended in order to include one representative of the National Productivity Council.

A list of the members of the reconstituted Council is given at Annexure I.

ITEM NO. 3.—To report the action taken on the recommendations/decisions of the Council made at the 13th meeting

1. The All India Council for Technical Education held its 13th meeting on the 30th April, 1960. The action taken

on the recommendations/decisions of the Council is reported below :—

<i>Recommendations/Decision</i>	<i>Action taken</i>
(a) Common Examination for admission to Engineering Colleges	
<p>The Council recommended that the question of holding a common examination for admission to all engineering colleges in the country should be pursued with the State Governments and other authorities concerned.</p>	<p>All the State Governments have been requested to reconsider the proposal made by the Council. In the meantime, the matter was further examined by the Co-ordinating Committee at its meeting held on the 1st November, 1960. The Committee recommended that in each State a single Selection Board should be set up for selecting candidates for all institutions in that State. For this purpose, the Committee recommended that the seats of all institutions should be pooled together and admissions to them should be made through the State Selection Board.</p> <p>This question was also discussed at the Chief Ministers' Conference held on 15th January, 1961, when it was agreed that in each State there should be a Common Selection Board for selecting candidates for admission to all technical institutions in that State. As regards the mode of selection, it was agreed that the State Governments should examine the matter and formulate proposals for holding an admission test or for any other suitable alternative mode of selection.</p> <p>A detailed report on recommendations of the Co-ordinating Committee and the Chief Minister's Conference are given under item Nos. 4 & 9 of this agenda.</p>
(b) Teachers for Technical Institutions	
<p>In order to remedy the situation created by shortage of staff at technical institutions, the Council recommended that greater participation by qualified men in industries may be secured.</p>	<p>Major industrial concerns in the country have been requested to assist technical institutions by deputing their experts to do part-time teaching work.</p>

c) Minimum age limit for admission to the 5-year integrated course in Engineering

The Council agreed that as a transitional measure the minimum age limit for admission to engineering courses may be fixed at 16 plus, but ultimately when the new pattern of education at the secondary level is introduced throughout the country, it should be raised to 17 plus. Further, there should be uniformity in regard to the age of an entrant to Universities and colleges. Pending a consideration of this question by the University Grants Commission, the Council recommended that 1st July of the year in which admission is sought may be taken as the crucial date for determining the age of a candidate.

The recommendation of the Council regarding age limits for admission to engineering and technological Institutions has been accepted by the Central Government and the University Grants Commission. It has also been forwarded to all State Governments, Universities and technical institutions.

As regards the crucial date for determining the age of a candidate for admission to an institution the question was reviewed by the Co-ordinating Committee at its meeting held on the 1st November, 1960. At the suggestion of the then Chairman of the University Grants Commission, the Committee decided that, for purposes of uniformity 15th September (which had been fixed as the crucial date by the University Grants Commission for reckoning the age of an entrant to Universities and colleges) should be regarded as the crucial date for admission to Engineering/Technological courses.

The University Grants Commission confirmed the above decision at its meeting held on 26th April, 1961 and the decision is now being communicated to all Universities, State Governments and Technical Institutions in the country.

(d) Mining Engineering Training

The Council recommended that a Directorate of Practical Training should be set up to organise, supervise and co-ordinate the practical training of mining students in the country as a whole.

Arrangements are in progress to set up a Directorate of Practical Training for Mining students. A small unit has also been started at the Indian School of Mines and Applied Geology, Dhanbad to organise the practical training of mining students in 1960-61. This Unit will continue to make

<i>Recommendations/Decision</i>	<i>Action taken</i>
	arrangements for the practical training till the Directorate is set up.
(c) Re-admission of students failing in the first year	
The Council recommended that a statistical study of the failures should be made to enable the Council to consider the question whether one attempt or two attempts should be permitted to students to pass the first year examination.	Necessary data have been collected from technical institutions in the country, and a note has been placed before the Council under item No. 13.
(f) Admissions to Technical Institutions in excess of sanctioned intake	
The Council recommended that technical institutions may be permitted to exceed the sanctioned intake upto a limit of 10% to enable the institutions to provide facilities to failed students. Further, no rigid formula should be laid down restricting the admission of either failed students or of new entrants ; Principals of Colleges should be given freedom to regulate admissions.	The recommendations has been forwarded to State Governments, University Grants Commission and technical institutions.
(g) Inclusion of expenditure incurred by Polytechnics on award of scholarships as an approved item of expenditure for recurring grants	
The Council recommended that the expenditure incurred by technical institutions on the award of scholarships instituted by them should be considered as an approved item of expenditure for the Central grant-in-aid provided the scholarships are given only on consideration of merit and poverty.	The recommendation is under the consideration of the Central Government.
(h) Progress of schemes of Technical Education under the Second Five Year Plan	
The Council recommended the continuance of financial support to the Administrative Staff College, Hyderabad.	The recommendation has been accepted by the Central Government.

(i) Report of the Working Group on Technical Education for the Third Five Year Plan

The Council agreed generally with the approach made by the Working Group in the formulation of the Third Five Year Plan of Technical Education but expressed the view that increased provision should be made in all technical institutions for equipping libraries on an adequate scale.

The report of the Working Group as also the recommendations of the Council have been kept in view in formulating the Third Five Year Plans of the Centre and the States.

The Council considered it essential that teaching staff in technical institutions should be given adequate scales of pay and other benefits particularly residential accommodation. The Council emphasised the necessity of providing scholarships and loans to ensure that on account of financial difficulties, meritorious students would not be denied the opportunity of undergoing technical courses. The Council also stressed the necessity of adequate provision in the Third Five Year Plan for developing institutions providing courses in Commerce and Applied Art.

(j) Establishment of a Regional Engineering College at Rourkela

The Council recommended that a Regional College should be established at Rourkela. The Council also recommended that the question of establishing Regional Colleges in the remaining States should be considered on merits.

In consultation with the Planning Commission, it has been decided to establish seven more Regional Colleges during the Third Plan period, including one at Rourkela.

(k) Establishment of a Foundry and Forging Institute at Ranchi

The Council recommended the acceptance of the scheme for the establishment of a Central Institute for Foundry and Forging at Ranchi. The Council, however, expressed the view that the Expert Committee should reconsider the question of the intake capacity of the proposed

The scheme is being revised by the Expert Committee in the light of the observations of the All India Council.

institute after taking into account the firm requirements of the industry for trained personnel in this field. The Council was also of the view that such institutions in specialised fields should not prepare students for degrees of Universities but should award their own certificates.

(l) Recommendations of the Regional Committees

The Council approved schemes prepared by its Northern Regional Committee for the development of six existing non-university institutions providing courses in engineering and technology and for the establishment of three new non-university institutions. The estimated cost of all the above development is Rs. 54,90,518 non-recurring and Rs. 8,78,550 additional recurring (ultimate). The Council also recommended loans amounting to Rs. 15,36,400 for the construction of students' hostels in the institutions. In addition, the Council recommended revised estimates of recurring grants to nine non-university diploma institutions.

The recommendations of the Council have been accepted by the Central Government.

(m) Reservation of seats for Scheduled Castes and Scheduled Tribes

The Council recommended that the number of reserved seats at a technical institution for all classes or group of students from backward sections should not ordinarily exceed 25% of the total number of seats available with provision for marginal adjustments not exceeding 10% of such seats, in the case of States or Territories with special problems. The Council further recommended that students admitted in the reserved seats should have a certain minimum standard of marks; and the gap in the marks secured

The recommendations in respect of reservation of seats has been accepted by the Central Government. It has also been forwarded to all State Governments, universities and technical institutions.

All State Governments have been requested to reserve at least 25% of the seats in their institutions for students belonging to other States. The matter has also been reported to the Council separately under item No. 4.

at the qualifying examination by the last person admitted in the reserved seats and that in the open seats should not exceed 10%. Further such reservation, may continue for a period of 10 years and thereafter they should be gradually reduced over the next 10 to 15 years, so that at the end of 20 to 25 years the reserved seats are reduced to nil.

The Council was also of the view that admissions to institutions in the States should be open to students from all over the country and it should be the endeavour of the institutions to admit some students from outside the State.

(n) **Establishment of an Institute for Hydrodynamics**

The Council did not favour the establishment of a separate Institute for Hydrodynamics. The Council recommended that the activities of the Central Water and Power Research Station at Poona, should be developed so as to provide for advanced training in Fluid Mechanics, Hydraulics, Irrigation, Hydraulic Structures and related fields.

The recommendation of the Council has been communicated to the Central Water and Power Commission.

(o) **Reconstitution of the Co-ordinating Committee**

In view of the creation of the new State of Gujarat, the State would be represented on the Co-ordinating Committee during the period 1-7-1961 to 30-6-1962.

The Director of Technical Education, Gujarat State has been nominated as State Government's representative on the Co-ordinating Committee for a period of one year.

(p) **To nominate a representative of the All India Council for Technical Education on the Board of Governors of the School of Town and Country Planning**

The Council nominated Shri A. D. Pandit, Joint Secretary, Ministry of Works, Housing and Supply as its representative on the Board of Governors of the School of Town and Country Planning.

Shri A. D. Pandit regretted his inability to serve on the Board. The Chairman of the All India Council therefore nominated Shri H. P. Sinha as the Council's representative on the Board of Governors of the School. Shri Sinha has accepted the membership.

ITEM No. 4.—To report the important decisions taken by the Co-ordinating Committee since the last meeting of the Council

Since the last meeting of the Council, the Co-ordinating Committee held a meeting on the 1st November, 1960. The important decisions and recommendations of the Committee are as given below :—

(a) Minimum age limit for admission to the Five Year integrated course in Engineering

The Co-ordinating Committee reviewed the question of minimum age limit for admission to Engineering Courses. The All India Council for Technical Education had made certain recommendations in this regard which are reported under Item No. 3.

At the suggestion of the Chairman, University Grants Commission, the Committee decided that, for purposes of uniformity, 15th September which had been fixed as the crucial date by the University Grants Commission for reckoning the age of an entrant to Universities and College should be regarded as the crucial date for admission to Engineering/ Technological Courses.

(b) Reservation of seats for ex-State students

The Central Government have recommended to all State Governments and Institutions in the country to reserve at least 25% of the seats for students belonging to other States. A point was raised at the meeting of the Co-ordinating Committee as to whether for the reserved seats, *ex-State* students of lower merit than the students of the State concerned should be admitted in the absence of an adequate response from students of higher merit. The Co-ordinating Committee was of the view that only when other things were equal, preference should be given to *ex-State* students in the context of the reserved seats. *Ex-State* students of a decidedly lower merit should not be admitted to the exclusion of better students from within the State itself only because of the fact that a certain number of seats were reserved for the former.

(c) Common entrance examination for admission to engineering Colleges

The Committee expressed the view that, pending a final decision on the question of a common entrance examination,

the existing position in respect of the method of admission followed in different States should be improved immediately. The Committee recommended that in each State a single Selection Board should be set up for selecting candidates for all institutions. For this purpose, the seats of all institutions should be pooled and admissions to them should be made through the State Selection Board. The Board should include the Principals or representatives of all institutions concerned in addition to experts.

(d) **Development of facilities for architectural education**

The Committee approved the following recommendations of the All India Board of Technical Studies in Architecture and Regional Planning regarding development of facilities for Architectural education in the country.

Longer-term Measures.—(i) During the Third Five-Year Plan period, the States that have no facilities of their own for architectural studies should be assisted to develop such facilities subject to the proviso that the necessary staff for conducting the courses are available and the standards of instruction etc., are ensured. Detailed schemes regarding the starting of architectural courses in particular institutions should be drawn up by the Regional Committees.

(ii) About ten architects should be sent abroad every year under the various Technical Assistance Programmes for further training in the United Kingdom and the United States of America on the condition that on their return they will serve on the staff of architectural institutions.

(iii) About 10 candidates should be selected under the Teacher Training Programme of the Ministry of Scientific Research & Cultural Affairs and trained as teachers for architectural institutions.

Short-term Measures.—(i) The system of Architectural education in the country should be elastic so that those civil engineering graduates who wish to qualify as architects, could do so by undergoing a course for a shorter period. The Architecture Board should formulate a suitable scheme for the purpose. The scheme, after approval, may be implemented at selected institutions.

(ii) The possibility of securing the services of architects from other countries for teaching posts in India should be explored.

(iii) The Ministry of Scientific Research & Cultural Affairs should compile a roster of practising architects in India who possess good academic qualifications and are interested in teaching. The services of those architects should be secured by architectural schools who are in need of teachers.

Other Measures—The Committee approved, in principle, the development plans of Baroda University, Madras University and J. J. College of Architecture, Bombay, for the development of facilities for architectural education and decided that the details be examined by the concerned Regional Committees. The Regional Committees should make an assessment of the additional instructional facilities required for the implementation of the schemes. The Committee also agreed that the Bengal Engineering College should increase its intake from 20 to 30 students and the question of additional instructional facilities for the purpose should be examined by the Eastern Regional Committee.

Private practice by the teaching staff of architectural institutions—The Committee recommended that instead of individual members of staff of an architectural school engaging in private practice, the school as a whole should undertake professional work in the field consistent with its normal activities. The head of the institutions in consultation with the professor of architecture should decide from time to time the particular assignments that the school should accept. They should also decide which member or members of staff should work on the assignment. The fees obtained by the execution of the assignment should be distributed to the members of the staff who worked on the project after deducting an appropriate share for the institution for the facilities provided.

Wherever a particular institution wishes to permit its individual members of staff to do private practice, the Committee was of the view that no rigid rules could be laid down. The terms and conditions on which an individual teacher may do private practice, should be left to the institution concerned to decide according to the circumstances in each case. The important thing, however, is that without prejudice to his normal teaching work, a teacher should have opportunities of keeping himself in touch with professional work.

(c) **Development of Management Education**

The Co-ordinating Committee approved the model list of instructional facilities prepared by the All India Board

of Management Studies in accordance with the new scheme. The Committee further approved the recommendations of the Board regarding the estimates of cost and the development of the following management institutions :

- (i) Department of Business Management, Bombay University, Bombay.
- (ii) Department of Business Management, Madras University, Madras.
- (iii) Delhi School of Economics.
- (iv) All India Institute of Social Welfare and Business Management, Calcutta.

The Committee also approved that Gujarat University, Ahmedabad be selected as a Centre for conducting courses in Industrial Management and Business Management.

(f) **Double-Shift in Engineering Colleges**

The Chairman of the All India Council for Technical Education had set up an Expert Committee under the Chairmanship of Lala Shri Ram to examine the suggestion of the Northern Regional Committee regarding possibility of starting double-shift in such institutions where 80% of sanctioned posts were filled up. The Expert Committee discussed in detail the present position of staff at technical institutions, and its impact on the possibility of expanding training facilities in order to cater for a larger number of students. The Committee decided that the Regional Committees should be requested to examine in detail how far the expansion of existing institutions would be practicable without large addition to the existing staff and by staggering the time table in a suitable manner.

The Coordinating Committee agreed generally with the approach suggested by the Expert Committee to the problem of expansion of existing institutions and desired that the question of final selection of institutions, the order of expansion to be undertaken at each, the estimates of cost etc. should be examined in detail by the Regional Committees. The Regional Committees have accordingly been requested to examine the matter and formulate proposals for consideration of the All India Council for Technical Education.

(g) **Admission of B. Scs. to Engineering and technological courses**

The Committee recommended that for the next five years, institutions conducting Five-Year Integrated Course

may admit first division graduates in Science to the Second year class.

As regards the question of preparing a scheme for a special three-year course in engineering/technology for graduates in science, the Committee decided that the Chairman may appoint a small committee of experts to formulate the scheme.

(h) Provision of student amenities

The Committee examined the recommendations of the Sub-Committee in relation to the facilities already included in the model list for engineering colleges and Polytechnics and decided that the following additional amenities should be provided at each institution :—

	Degree Institutions		Diploma Institutions	
	120 intake	240 intake	120 intake	240 intake
1. Students' Canteen and Tuck-shop (net area).	2,000 sq. ft.	3,500 sq. ft.	1,500 sq. ft.	2,500 sq. ft.
2. Cycle Shed	The rate should be Rs. 20 per cycle. The capacity of the cycle shed at each institution should be decided by the concerned Regional Committee.			
3. N.C.C. Block	In accordance with the requirements prescribed by the Defence Ministry.			
4. Dispensary	350 sq. ft. for all institutions.			
5. Water-Cooler	At least one unit at each institution. In the case of institutions with a large student body, the number required should be determined by the Regional Committee.			

As regards students' canteen, the Committee decided that the buildings should be of a purely functional type similar to workshop sheds. The net areas recommended above should be increased by not more than 20% for piling for this type of construction.

In view of the limited financial resources available and the need to economise on buildings, the Committee

decided that the question of provision of auditorium at technical institutions should be deferred. The institutions should use their large drawing halls as Assembly Halls for the present.

i) Grant of exemption to candidates who have passed Higher Secondary Examination in the technical stream in the duration of diploma courses at the polytechnics

The Committee decided that a small Committee should be set up by the Board of Technical Studies in Engineering and Metallurgy to examine the matter in detail and to recommend a uniform pattern which should be followed by all States.

(j) Shortage of staff at technical institutions

The Committee expressed grave concern over the serious shortage of staff generally at all technical institutions in the country as was evident from the reports received from the Regional Offices. The shortage varied from institution to institution and at the same institution it varied from one category of staff to another, but the overall position was such that unless suitable measures were adopted with a sense of urgency to improve the staff, there was a serious danger of standards, not high enough at present, falling further. The position was bound to become worse with the further expansion of technical education and establishment of new institutions proposed for the Third Plan period. The Committee decided that a detailed note on the subject should be prepared and submitted for the consideration of the National Development Council when it met to finalise the Third Five-Year Plan. Meanwhile, the following measures should be adopted :

- (i) The scheme of improved salary scales recommended by the Central Government should be implemented at all institutions to prevent the 'flight' of existing teachers to non-teaching positions, and to ensure a satisfactory recruitment of new teachers to vacant positions.
- (ii) The Teacher Training Programme of the Central Government should be expanded in order to train larger numbers of persons. The State Governments also should implement schemes for the training of as many teachers as possible.

- (iii) Renewed efforts should be made to enlist the co-operation of industrial concerns and government departments in providing the services of their technical experts as part time or full time teachers at technical institutions.
- (iv) New institutions should be established only when the existing ones have been adequately staffed. If in a particular State, existing government institutions are already having a serious shortage of staff, the State Government concerned should not establish any new institution till the position at the former has improved. Similarly, if in a State, non-government institutions are having serious shortage of staff, no new institutions in the private sector should start functioning till the position at the former has improved. Otherwise, the existing institutions will continue to be in an unsatisfactory state and the new institutions will face a worse situation.

(k) Rate of Tuition fee charge for degree/diploma courses

The Committee decided that with a view to having uniformity regarding the fees charged for degree and diploma courses, the Regional Committee should collect detailed information and examine the matter. The Regional Committees should also make recommendations regarding the scale of fees to be charged by non-government institutions in their respective regions.

(l) Mining Engineering

Instructional facilities for Degree Courses in Mining Engineering—The Co-ordinating Committee approved the revised list prepared by the Expert Committee in respect of instructional facilities required for a Five-Year Integrated Course in Mining Engineering subject to certain modifications.

The Committee also approved the revised staff schedule for diploma courses in Mining when conducted at an engineering polytechnic and at an independent mining school. The Committee further approved the lists of equipment for engineering laboratories and workshops for mining schools as formulated by the Expert Committee.

(m) Pharmaceutical Education

The Committee approved the recommendations of the Pharmaceutical Education Committee that the existing

three-year course for B. Pharm. degree should be revised to a four-year integrated course after Higher Secondary and also approved the setting up of a Sub-Committee to revise list of instructional facilities *viz.* buildings, staff, equipment (including library and furniture) etc. required for the new course. The Co-ordinating Committee also approved the recommendation of the Pharmaceutical Education Committee for organising Post-Graduate courses in Pharmaceutical Technology for the present only at the following two centres :

- (1) College of Engineering & Technology, Jadavpur University.
- (2) Department of Chemical Technology, Bombay University, Bombay.

As regards the request of Saugar University for additional accommodation, the Co-ordinating Committee agreed with the recommendation of the Pharmaceutical Committee that the additional accommodation required for Degree Course in Pharmaceutical Technology by the Department of Pharmacy should be provided by the University itself.

The Co-ordinating Committee recommended that an additional grant of Rs. 55,000 be given to the University of Punjab for equipment for the Department of Pharmacy, for conducting Degree Course in Ph. Technology.

(n) **Courses of Studies and instructional facilities for degree in Metallurgy**

The Co-ordinating Committee approved the model schemes of studies for a 5-year integrated degree course in Metallurgy, 3-year National Certificate Course in Metallurgy and one year Advanced Certificate Course in Metallurgy as formulated by the Expert Committee. The model list of instructional facilities required for degree and diploma courses in Metallurgy were also approved.

The Co-ordinating Committee also approved the estimates of cost of additional instructional facilities required at the following institutions in order to bring them up to the required standards :

- (1) College of Mining & Metallurgy, Banaras Hindu University.
- (2) College of Engineering & Metallurgy, Department of Metallurgy, Poona.

- (3) College of Engineering & Metallurgy, Raipur.
- (4) Bihar Institute of Technology, Sindri.

The Co-ordinating Committee also approved development of facilities for National Certificate and Advanced Certificate Courses in Metallurgy at a number of selected centres.

(o) Estimates for Technical Institutions

On the recommendations of the Regional Committees, the Co-ordinating Committee approved estimates for the establishment of technical institutions, improvement and development of existing institutions etc. as given in Annexure-II.

ITEM No. 5—**To report the progress of Schemes of Technical Education included in the Second Five Year Plan**

A. STATE PLANS

1. It was reported to the All India Council at its meeting held on the 30th April, 1960 that the Second Five Year Plans of State Governments were revised from time to time and the revised plan on the 30th April included the establishment of eight engineering colleges and 47 polytechnics. One Engineering College included earlier in the State Plans was established under the auspices of a University. The plans have since been further revised and the revised plans as at the end of 1960-61 provide for ten engineering colleges (including the University College) and fifty-two polytechnics. The State-wise distribution of the institutions and the position regarding their location etc. are given in the statement at Annexure-III. The additional college now included relates to the starting of degree courses in the Karad Polytechnic in Maharashtra. After a detailed discussion between the Chairman, All India Council for Technical Education and Chief Minister Maharashtra, it has been agreed that degree courses may be conducted in this polytechnic as an experimental measure for a period about five years. All the engineering colleges and 44 polytechnics have started functioning. The rest of the polytechnics are in process of establishment and are expected to start functioning in the course of next two years.

2. It was also reported to All India Council for Technical Education at its last meeting that the revised State Plans included 42 Junior Technical Schools out of which 20 had started functioning. The position has since changed and

45 are provided for in the plans out of which 38 schools have already started functioning. The statement at Annexure-IV indicates the present position State-wise.

3. During the year 1960-61, the Central Government sanctioned a sum of Rs. 84.17 lacs to State Governments as grants-in-aid for various schemes of Technical Education.

B. CENTRAL PLAN

(a) Indian Institute of Technology, Kharagpur

1. In addition to four year degree courses, five-year integrated courses after H.S.S.C. were instituted with effect from 1960 session. 420 students were admitted to both four and five-year courses during this session.

The present student enrolment at the Institute is as given below :—

	1960-61
(i) Under-graduate courses	1,532
(ii) Post-graduate courses	190
(iii) Post Doctorate fellows and Research Scholars	50
(iv) Teacher-Trainees	60
	1,832

2. Out of the various Post-graduate courses offered by the Institute as reported earlier, two *viz.*, Plasticity and Meteorology were discontinued during 1960-61. A Post-graduate course in Mechanisms and Vibrations was introduced.

3. The Report of the Reviewing Committee was considered by the Board of Governors. The Visitor's orders on the recommendations of the Committee have been communicated to the Institute.

(b) Indian Institute of Technology, Bombay

4. The Institute has moved into its own buildings at Powai. For the third session that started in July 1960, 158 students were admitted to the first year of five-year integrated courses and 139 students to the second year. For admission to the second year, a joint entrance examination was conducted for the Bombay and Kharagpur Institutes.

5. The Institute has received so far equipment worth about Rs. 81.45 lakhs and 27.59 lakhs under the Unesco Programme and Bilateral Agreement respectively. 10 Experts and 3 Scientific Translators, whose services were secured

under the Unesco Programme, are at present working at the Institute. 24 teachers of the Institute are undergoing training abroad.

(c) **Indian Institute of Technology, Madras**

6. The Indian Institute of Technology, Madras, started its Second session in July 1960 when the following admission was made to the five-year degree courses :—

120 students to the first year.

18 students to the second year.

The student strength of the Institute at present is 258.

7. The Institute has formulated a master plan estimated at about Rs. 937.69 lakhs (including German aid of about Rs. 230 lakhs). It is proposed to implement the plan in a phased manner during the Third Plan period.

8. The Institute has started its building construction with the following buildings estimated to cost Rs. 70 lakhs :—

(a) Institute building first phase.

(b) 2 hostels for 400 students.

(c) 7 units of workshops.

Due to an acute shortage of steel the Institute could not keep to schedule for the completion of the above buildings by July, 1960. Therefore, it has had to continue its activities at the A. C. College of Technology and the Central Leather Research Institute. It has, however, moved its departments to the new buildings. The ground floor of the hostels has also been occupied. The second phase of the building programme consisting of two more hostels, Institute building II phase, seven more workshop units, staff quarters, Officers' hostel, guest house etc. started in November, 1960.

9. The German assistance received so far consists of—

(i) Four Professors and one Foreman

(ii) Facilities for the training of 17 teachers in Germany.

(iii) Equipment and books costing about Rs. 27.5 lacs.

(d) **Indian Institute of Technology, Kanpur**

10. The Institute started its first academic session in July 1960 when 99 students were admitted to the first year of five-year integrated courses in (i) Chemical Engineering

(ii) Civil Engineering (iii) Mechanical Engineering (iv) Electrical Engineering and (v) Metallurgical Engineering. It is proposed to admit in 1961-62 another batch of 100 students to the first year class.

11. The Institute has been registered as a Society under the Societies Registration Act, 1860, pending incorporation by an Act of Parliament. A Board of Governors under the Chairmanship of Shri C. B. Gupta, Chief Minister, U.P., has been set up for the administration of the Institute.

12. At present the Institute is temporarily housed in a newly constructed wing of the Harcourt Butler Technological Institute. Detailed plans and estimates of the permanent buildings of the Institute are being prepared and construction is expected to start in the course of next few months. The necessary staff is also being recruited.

(c) College of Engineering and Technology, Delhi

13. Arrangements are in progress to start the College in July 1961 when the first batch of 150 students will be admitted to the first year of five-year Integrated degree courses in Civil, Mechanical, Electrical and Chemical Engineering and Textile Technology. When fully developed the College will have about 1250 students in first-degree courses and about 250 students in post-graduate courses.

14. About 220 acres of land have been acquired for the College and construction of the buildings has started.

15. Five British Experts have arrived and are assisting in the establishment of the College.

(f) Establishment of eight Regional Engineering Colleges and 26 Polytechnics

16. The Warangal College started functioning in 1959. In 1960, Durgapur, Jamshedpur, Bhopal, Mangalore, Nagpur and Srinagar Colleges started. The college at Allahabad is expected to start in August, 1961.

17. As regards the Centrally-sponsored polytechnics, their exact location and other details were reported to the Council at its last meeting held in April 1960. The polytechnics at Nagercoil and Vellore (Madras) and Nizamabad and Proddatur (Andhra Pradesh) started functioning in 1959. In 1960-61, the following polytechnics started :—

Kotah & Alwar (Rajasthan)

Purnea & Darbhanga (Bihar)

Silchar (Assam)
 Bombay & Jalgaon (Maharashtra).
 Porbander (Gujerat)
 Khandwa (Madhya Pradesh)
 Kottayam (Kerala)
 Krishanarajapet (Mysore)

The remaining Polytechnics are in process of establishment at the following centres and are expected to start functioning in the course of next two years :—

Durg (Madhya Pradesh); Raichur (Mysore); Kanpur, Faizabad and Mirzapur (U.P.); Batala, Gurdaspur and Guru Tegh Bhadurgarh (Punjab); Ultadanga, Malda and Barachampa (W. Bengal).

(g) The Administrative Staff College, Hyderabad

18. Since its establishment in December, 1957, the College conducted seven courses (each of three months duration) and trained 268 candidates. The eighth course is in progress.

19. A non-recurring grant of Rs. 7.00 lakhs and an interest free loan of Rs. 9.00 lakhs have been given by the Central Government so far. A recurring grant of Rs. 3.00 lacs for the years 1957-58, 1958-59 and 1959-60 has also been paid. The Central Government have agreed to continue a block recurring grant of Rs. 2.50 lakhs for a further period of three years.

(h) Loans for the construction of hostels

20. Since the beginning of the Second Five Year Plan an amount of Rs. 506.36 lacs has been sanctioned for the construction of hostels. Hostel accommodation for about 15,200 students has been constructed or is in process of being constructed.

(i) Grant-in-aid to Non-Government Institutions

21. For the various schemes of establishment of non-government institutions, improvement and development of existing institutions and for the development of specialised courses as recommended by All India Council for Technical Education, the Central Government has sanctioned during 1960-61, grants amounting to Rs. 109.38 lakhs. The total amount of grant-in-aid paid by the Central Government during the Second Plan period is of the order of Rs. 45.8 lakhs.

(j) **Establishment of Technical Institutions by private agencies under "Open Door Policy"** :

22. It was reported to the All India Council at its last meeting held in April, 1960 that during the Second Plan period nine engineering colleges and 21 polytechnics had been approved in different parts of the country. Since then certain changes have taken place as indicated below :—

- (i) One more engineering college at Hassan (Mysore) and two more polytechnics in Madras have been approved.
- (ii) The Engineering College at Tirupathi—an University institution (A.P.) has been shown as State Plan institution.
- (iii) The engineering college approved for Calcutta will now be set up by the State Government under its Third Plan.
- (iv) One more engineering college has been approved for Vidisha (Madhya Pradesh) under the aegis of Maharaja Jiwajirao Education Society, Vidisha.
- (v) The Bombay College proposed to be established by the Bharatiya Vidya Bhawan has been approved in principle.

23. With these changes, the position as at the end of plan period is as shown below :—

State	Engineering Colleges	Polytechnics
1. Madras	2 Coimbatore and Madurai.	10 Avadi, Pollachi Salem, Tanjore-Annamalianagar, Virudhunagar, Talaiyuthu, Kancheepuram, Sirkali & Gudiyatham.
2. Kerala	2 Quilon and Palghat.	4 Quilon, Pandalam, Alleppey and Valapad.
3. Andhra Pradesh	..	3 Hyderabad, Tanuku and Wanaparthy.
4. Mysore	2 Gulbarga and Hassan.	3 Bhagalkot and two in Bangalore.
5. Punjab	1 Ludhiana	..
6. Madhya Pradesh	2 Gwalior and Vidisha.	1 Bhilsa (Vidisha).

1	2	3
7. Maharashtra	1 Bombay	1 Latur.
8. Orissa	..	1 Kendrapara.
	10	23

All the above institutions excepting the Bombay College have started functioning.

(k) Merit-cum-Means Scholarships

24. This scheme which was started in 1959-60 has been continued during the year under report. 930 additional Scholarships for fresh entrants (583 for degree students and 347 for diploma students) have been instituted during this year. In order to cover a larger number of brilliant students under the scheme, the monetary limits of eligibility have been raised and candidates whose family income does not exceed Rs. 7,500 per year or Rs. 125 per month *per capita* are now eligible for the award of the scholarships.

(l) Technical-Teachers-Training Programme

25. During 1960-61 a further batch of 111 candidates was selected for training under the Scheme of whom 89 joined.

ITEM No. 6

The All India Boards of Technical Studies—(a) Matters for report (b) Matters for decision

I. APPLIED ART BOARD

(a) MATTERS FOR REPORT

Meetings

Since the last meeting of the All India Council, the Applied Art Board held three meetings *viz.* on 15th November, 1960, 15th December, 1960 and 22nd April 1961.

(b) MATTERS FOR DECISION

Art Education for the Physically Handicapped

1. The Board considered a proposal made by the Delhi Polytechnic regarding establishment of a *separate Section* in the Art Department for the training of deaf and dumb

persons. The Board did not favour the proposal for the following reasons :—

- (i) The physically handicapped have a keen power of observation. Segregation would do them more harm than good as this would deprive them of learning things by association.
- (ii) Even the deaf and the dumb will not experience any difficulty in practical work and theory could be learnt by them, if properly guided, through reading material.

The Board felt that physically handicapped students should be entitled to the same Diplomas/Certificates as other students so that they could pursue the vocation with competence and face life with confidence. In their case, however, exemptions may have to be made from oral or such other tests. The authority, making the award may, if necessary, state the exemptions given in the certificates.

Scheme of Examinations for Part-time courses

2. The Co-ordinating Committee of the All India Council for Technical Education at its meeting held on the 1st November, 1960, decided that the entire system of examinations for part-time courses, the terms to be kept by students and related aspects should be examined in detail by the different Boards of Technical Studies. The Committee desired that the Boards should make recommendations on the particular system to be followed in each field consistent with the aims and objectives of part-time courses.

3. The Applied Art Board considered the recommendations of the Co-ordinating Committee *vis-a-vis* part-time courses in Applied Art and in Printing Technology. The Board recommended that the existing rules for examination in Applied Art should continue. As regards Printing Technology, the Board noted that the examinations were being conducted by the State Boards of Technical Education.

Facilities for National Certificate Courses in Printing Technology

4. On the recommendations of its Expert Committee in Printing Technology, the Board revised the estimates for the library of Regional Schools of Printing as shown below :—

	Rs.
Library books	20,000
Library Equipment & Furniture	5,000
Journals and Periodicals	1,500
	per year

Centres for Industrial Design Course

5. The Co-ordinating Committee at its meeting held on the 1st March, 1960 accepted the recommendations of the Applied Art Board that four art institutions selected on a regional basis should be developed for facilities for training in Industrial Design. The Committee also approved the recommendation of the Board that Sir Gordon Russel, Director General, Council of Industrial Design, U.K. should be invited to visit India and advise on the setting up of these four Industrial Design training centres.

6. The Board at its meeting held on the 22nd April, 1961 expressed the view that the Industrial Design centres should be located in well established art institutions which were functioning in areas that have a large industrial and commercial activity. On the basis of these considerations the Board selected the following four institutions for the development of Industrial Design courses :—

Northern Region	.	Delhi Polytechnic, Delhi.
Eastern Region	.	Government College of Art & Crafts, Calcutta.
Southern Region	.	Government College of Art & Crafts, Madras.
Western Region	.	Sir J. J. Institute of Applied Art, Bombay.

7. The Board also recommended that in case Sir Gordon Russel was unable to visit India to advise on the setting up of the above four centres, Mr. Hans Schlegler, another eminent industrial designer in the U.K. should be invited. The Board also recommended that in order that these Industrial Design centres may be organised along correct lines, the Central Government may send a small team of persons connected with art institutions to study the latest developments in this field in advanced countries.

Scheme of National Diploma courses in Applied Art & Crafts

8. The Board had prepared in 1960 a National Diploma course in Applied Art and Crafts that envisaged a five-year training consisting of

- (i) a preparatory course of three years designated as the National Intermediate in Art.
- (ii) a two-year course designated as the National Diploma in Applied Art & Crafts.

The scheme also provided for a one year post-graduate of specialisation in particular branches of Applied Art and Crafts.

9. Subsequently, suggestions were received from time to time that the scheme of studies should be revised in the light of changed circumstances. The Board considered the suggestions and expressed the view that while it would not be desirable to modify the scheme all of a sudden, no course should remain static. The courses should be subject to constant review in the light of new situations that arise and modifications should be made wherever necessary. Another point kept in view by the Board was that under the Third Five Year Plan provision was proposed to be made to develop art education in each state in the country. The Board, therefore, set up an Expert Committee to re-examine the 1950 Scheme and to suggest modifications wherever necessary. The Committee was also asked to formulate a list of facilities required for conducting these courses in an Art School.

10. The Board at its meeting held on the 22nd April, 1961, approved the revised scheme formulated by the Expert Committee as also a model list of equipment, accommodation, staff, etc. required for conducting the revised National Diploma course in art schools. A copy of the revised scheme together with the model list as approved by the Board is given at Annexure V. The main features of the scheme are as given below :—

Courses of Study.—The duration of the National Diploma course should remain five years as before with Matriculation or Higher Secondary as the minimum admission qualification. The course should be in two parts *viz.* a preparatory course of two years, followed by an advanced course of three years. The subjects to be included in the courses should consist of—

Painting;

Sculpture and

Applied/Commercial Art.

No rigid syllabuses should be prescribed, as rigidity in art education will do more harm than good. Art Education should have a prescribed outline of objectives to be achieved but the development of an Art school should be left to the art teachers. The Schools should develop within the framework of the objectives their own curriculum and syllabuses according to local needs, creative ability of students and the staff available. There should be at least 960 working hours in each year and

more emphasis should be laid on practice than on theory. Broadly 30-40% of the total time should be devoted to lecture work and the remaining to practical work.

Instructional facilities

A model art school should have a total student strength of 120 that may be raised to 150 wherever possible. The intake to the courses should be of the order of 30 students.

An art student would require more floor area than his counterpart of other fields of Engineering & Technology. In addition, extra space would be required in the art school for the display of life size models.

The teacher-student ratio should not be less than 1:15. A list of teachers required and their qualifications is given in the scheme at Annexure V.

Estimates of Cost

The estimates of cost for a typical art school conducting the five-year diploma courses are as given below :—

<i>Non-recurring :</i>	<i>in lakhs</i>
(i) Buildings	7.62
(ii) Equipment	1.33
(iii) Furniture	0.20
(iv) Library	0.10
TOTAL	9.25
<i>Recurring :</i>	
(i) Staff	1.8
(ii) Consumable stores	0.07
(iii) Contingencies	0.05
(iv) Library—Periodicals and Journals	0.05
TOTAL	1.97

II. BOARD OF MANAGEMENT STUDIES

(a) MATTERS FOR REPORT

1. During the period under review the Board held one meeting on 12th December, 1960.

(b) MATTERS FOR DECISION

New Centres for Management Courses

1. The Board considered the question of the policy to be followed regarding the opening of new centres for Management Courses. At present there are four centres, one each at Madras, Bombay, Delhi and Calcutta, which are conducting part-time courses. The only persons who could take advantage of these courses are those who are residing in these centres. As regards full-time courses, the Board was of the view that the time was not as yet ripe to start such courses. In the circumstances, the Board decided that it should be our policy to develop as many additional centres as possible for conducting Management Courses on a part-time basis provided that the new centres were able to satisfy the necessary conditions in respect of staff and candidates for the courses.

2. The Board at its meeting held on 27th August, 1960 considered proposals received for organising Management Studies at Madurai (under the aegis of the Thiagarajar College Endowment Trust) and at Lucknow and Allahabad Universities, and set up Visiting Committees to examine the proposals. The Board at its meeting held on 12th December, 1960 considered the reports of the Visiting Committees and recommended that these additional centres be approved.

3. On the basis of the reports of the Visiting Committee the Board assessed the requirements of these centres as shown below :—

*Madurai**Courses Approved*

Part-time course in Business Management and Industrial Management.

Approved intake	30 to each of the above two courses.
Accommodation	18,000 sq. ft.
Equipment, Library and Furniture.	Rs. 1,08,500
Recurring	Rs. 1,50,000

The Trust authorities have agreed to make available the necessary space in their new buildings of the Thiagarajar College, Madurai. The Committee which inspected the college noted that the space which the Trust proposed to

make available for Management course was adequate in all respects.

Lucknow

Courses approved

Part-time course in Business Management and Industrial Management:

Approved intake—30 to each of the above two courses.

Accommodation—17,500 sq. ft. at Rs. 13 per sq. ft.
Rs. 2.275 lacs.

Equipment, Library and Furniture—Rs. 0.935 lacs.

Recurring—Rs. 1.5 lacs per annum.

Allahabad

Courses approved

Part-time course in Business Management and Part or full-time course on the slab system for Industrial Management:

Approved intake—30 to each of the above two courses.

Accommodation—18,000 sq. ft. at Rs. 13 per sq. ft.
Rs. 2.34 lacs.

Equipment, Library and furniture—Rs. 1,08,500

Recurring—Rs. 1,50,000

4. Board also recommended that the following conditions should be attached to grants given to the above institutions:

(a) To facilitate migration of candidates from one institution to another, the syllabus prescribed by the Board should be adhered to, with only minor variations.

(b) Persons admitted to the course should have a minimum of two years' industrial/commercial experience. There should be no relaxation of this rule for full-time or part-time students and it would be the responsibility of the institutions concerned to ensure that this condition was strictly observed.

(c) Every institution approved for a course of study in Management should draw up a programme for the appointment of full-time staff. A list of persons who have agreed to serve as teachers on a part-time basis should also be prepared. Admission to the course should be made only after satisfactory arrangements had been made for the appointment of full-time and part-time staff and this should be in

accordance with the pattern approved by the Courses Committee.

In the case of Lucknow and Allahabad Universities, the following additional conditions should be stipulated :—

- (d) “Students admitted to the course should not be less than 25 years of age on the 1st July of the year of admission.

5. The above recommendations of the Board are placed before the Council for consideration.

Building grant for the Department of Management Studies, Delhi School of Economics, Delhi University

6. On the 12th December, 1960, Vice-Chancellor, Delhi University forwarded a proposal to the University Grants Commission that the Management Studies Department of the University may be sanctioned a building grant to enable it to construct a separate building covering a plinth area of 17,000 sq. ft. estimated to cost Rs. 2.55 lacs at Rs. 15 per sq. ft. University Grants Commission forwarded the proposal to the Ministry for the recommendations of the Council. Since 1955 Delhi University has been conducting a part-time course in Business Management and the Department of Management Studies is housed in the Delhi School of Economics. From July, 1960, three other Departments of the University have also been allotted accommodation in School of Economics and in these circumstances, the University is finding it difficult to provide the necessary accommodation for the Department of Management Studies. The accommodation position has become more difficult since the Department will also conduct a course in Industrial Administration from July, 1961.

7. The Board considered the matter and recommended that a grant of Rs. 2.53 lakhs may be sanctioned to the University to enable it to construct a separate building of 17,000 sq. ft. for the Department of Management Studies.

8. No building grants have been sanctioned so far to Delhi University for its Business Management Department.

III. ENGINEERING BOARD

(a) MATTERS FOR REPORT

Meetings

1. During the period under review the Board held one meeting on 22nd February, 1961.

Revision of the National Certificate Course in Engineering

2. Since the Matriculation course is being gradually abolished and the Higher Secondary pattern is being established all over the country, the Board was generally of the view that the syllabus for the National Certificate course formulated earlier on the basis of admitting students with Matriculation qualification needs examination. The contents of the National Certificate course admitting students with Higher Secondary qualification for both Science and technical streams need revision and it is perhaps possible to reduce the duration of the course in the case of students from technical stream. At the same time it was observed that in a few cases where a change over to the Higher Secondary system has been made, the students from the technical stream were weak in basic science subjects and find it somewhat difficult to cope with the engineering course as compared to those who are from the science stream. In the case of both science and technical stream students, it was felt that the standard actually attained at present is not quite the same as what is expected, perhaps because of the reason that the Higher Secondary system itself needs more stabilisation and the institutions conducting the course need more experience with the scheme. The Board, therefore, felt it necessary that the *status quo* might be maintained until the results of the Higher Secondary Schools could be watched for some time longer. In the meanwhile it was suggested that the syllabus for the Higher Secondary Schools formulated and followed in various subjects should be examined *vis-a-vis* the existing syllabus of the National Certificate course with a view to studying in what manner the revision in the National Certificate course should be brought about.

Diploma Course in Electrical Communication Engineering

3. The Board noted that the Radio Engineering Committee recommended the continuation of a separate degree course in Electrical Communication Engineering in view of the growing importance of the subject and the rapid advances that are being made in the field but no further expansion of facilities should be undertaken at this stage since the existing training facilities would meet the demand during the 3rd Plan period. The Board, however, observed that the Working Group on Technical Education estimated the requirement of degree holders in the field of Tele-Communication Engineering at 25,00 during the 3rd Plan period while the supply

would be 2100. The Working Group also estimated the requirement of Tele-Communication Engineering degree holders for the Fourth Plan period as between 4500 and 3750. It was not clear to the Engineering Board how if further expansion is not to be made during the Third Plan period, the requirement in the 4th Plan could be met. The Board desired a clarification of this issue by the Radio Engineering Committee.

4. The Board accepted the need for conducting Radio Engineering course at the National Certificate level. It was, however, desired that the estimated requirement of 4,000 diploma holders (by the Radio Engineering Committee) by the end of 3rd Plan period and the suggested creation of training facilities for this purpose should be re-examined in the light of latest estimates made by the Working Group for diploma holders during the 3rd and 4th Plan periods at 500 and 1200-2400 respectively. In this context, a survey of facilities for training in Radio Engineering and the demand for such trained people made by the Directorate General of Resettlement and Employment may also be considered.

5. The Board considered the curriculum and detailed syllabus formulated by the Radio Engineering Committee for the National Certificate Course in Electrical Communication and expressed a doubt regarding the capacity of students at this level to follow the syllabus indicated for Mathematics during 1st and 2nd Years, and for Net Work Lines and Antennas for the 2nd and 3rd Years. It was suggested that simplification of theoretical aspect of the syllabus and intensification of the practical bias might be considered by the Radio Engineering Committee. The Board also suggested that the Radio Engineering Committee might examine whether this course can be organised as a Post-National Certificate course after the basic Electrical Engineering course. In formulation of the syllabus, the Radio Engineering Committee may co-opt one or two teaching members from institutions conducting this level of course.

Part-time National Diploma Course in Engineering at Polytechnic

6. The All India Council for Technical Education at its meeting held in 1959 agreed that the details of the scheme for Part-time National Diploma Course for the National Certificate holders should be formulated by each institution conducting the course and the schemes formulated by the institutions be approved by the Engineering Board. Accordingly the

Delhi Polytechnic prepared its scheme of part-time National Diploma Course in Engineering which was approved by the Board.

(b) **MATTERS FOR DECISION**

Pattern of Refrigeration and air-conditioning course

1. The Board had sometime back desired that the syllabus for a National Certificate Course in Refrigeration & Air-conditioning be drafted by its Syllabus Committee. The Board at its last meeting held on 22-2-1961 reviewed the position and expressed the view that a separate National Certificate Course in Refrigeration and Air conditioning is not called for. Instead, there should be a Post-Certificate course in the subject after the National Certificate either in Mechanical Engineering or in Electrical Engineering. The duration of the Post-Certificate Course in Refrigeration and Air-Conditioning should be two years part-time or one year full-time.

Pattern of Tele-communication Engineering Degree Course

2. The Co-ordinating Committee at its 27th meeting held on 18-10-1958 decided that in view of the unsatisfactory employment position of Tele-communication Engineering graduates the need or otherwise of a separate degree course in Tele-communication Engineering should be examined in consultation with the principals of institutions and employers of tele-communication graduates. Accordingly a Conference of heads of technical institutions conducting degree Courses in tele-communication engineering, experts and representatives of employing departments was held on 2-4-1960. After a careful examination of all aspects of the matter, the Conference recommended that in view of the growing importance of Electronics and Communication Engineering and the rapid advances made in the field, a separate degree Course in Electrical Communication Engineering should continue to be conducted by our institutions, but no further expansion of the training facilities need be undertaken since the existing facilities were adequate to meet the requirements of the Third Plan.

IV. CHEMICAL ENGINEERING BOARD

(a) **MATTERS FOR REPORT**

1. The Board held its meeting on the 1st December, 1960.

(b) MATTERS FOR DECISION

Expansion of facilities for Chemical Engineering

1. The Board considered the question of expansion of facilities for training in Chemical Engineering during the Third Plan period with a view to meeting the requirements of the Fourth Plan. The Board observed that the large scale expansion of chemical industry envisaged under the Third Five-Year Plan would require larger numbers of Chemical engineers. For instance, large projects dealing with petrochemical manufactures are proposed to be established in different parts of the country. The investment proposed in this field during the Third Plan period is of the order of Rs. 300 crores. On the basis that for an investment of Rs. 10 lakhs, one chemical engineering graduate is required, we need about 3000 chemical engineers during the next five years. Since, however, the exact nature and scope of expansion of chemical industry has not yet been finally decided, the Board recommended that for the present the estimates originally made by the Planning Commission of the requirements of chemical engineers *viz.* 3,621 degree-holders and 4,067 diploma-holders may be accepted for the purpose of expansion of training facilities and the position reviewed after a year.

2. The Board decided that all the four Higher Technological Institutes and the Delhi Engineering College may be asked to increase their admission capacity for chemical engineering degree course to 60 students per year. Similarly, other well established institutes that have been conducting chemical engineering degree course for more than 5 years should increase their admission capacity to 60 by having two batches of 30 each every year.

3. As regards the requirements for diploma-holders in Chemical Engineering, the Board observed that for chemical industry it is chemical operators who are actually required and not diploma-holders. The Board, therefore, recommended that the requirements for supervisory personnel for the chemical industry should be met by organising the training of a large number of chemical operators by setting up suitable institutions for the purpose near industrial centres. The Board has already prepared and the All India Council approved a scheme of training of chemical operators in collaboration with chemical industry.

Double admissions to institutions

4. The Board recommended that in order to have a continuous flow of chemical engineering graduates to industry,

admissions to institutions should be made twice a year *i.e.* in July and November instead of once a year as at present. Dr. Miessner, a German Chemical Engineering expert who attended the Board meeting, was also of the same view and stated that in Germany admissions to technical institutions were made twice a year. The Board appointed a Sub-Committee to work out a detailed scheme for making double admissions to institutions for chemical engineering courses.

Technical Chemistry course at Victoria Jubilee Technical Institute, Bombay

5. The Victoria Jubilee Technical Institute had submitted a proposal for starting a degree course in Technical Chemistry in which the main emphasis was on the analysis and testing of chemical products, instrumental analysis and statistical methods of control. The Board considered the scheme and expressed the view that the proposed course was not in accordance with the pattern of degree course in chemical engineering and chemical technology as approved by the All India Council. Moreover, the fields of study proposed to be included in the course have already been included in the revised pattern of chemical engineering course. The Board, therefore, recommended that the proposal of the institution be not accepted.

Diploma courses for training of Oilmill Superintendents and Foremen

6. The Board at its meeting held on the 9th April, 1960 considered the resolution of the Indian Central Oilseeds Committee regarding the training of Oilmill Superintendents, Foremen, etc. together with the schemes prepared by the Oil Technological Institute, Anantpur and the Oil Technologists Association of India, Kanpur for the purpose. The Board decided that in view of the fact that the expansion of oilseeds crushing industry was not being encouraged in the organised sector, there was no need to start diploma courses in this field. The decision of the Board was considered by the Marketing Sub-Committee of the Indian Central Oilseeds Committee which recommended that in order to improve the oilseeds crushing industry, it was necessary to arrange for the training of oilmill Superintendents and Foremen and, therefore, the schemes formulated for the purpose should be reconsidered.

7. The Board reconsidered the matter at its meeting held on the 1st December, 1960 and reiterated its earlier view that there was no need at present to start diploma course in oilseeds crushing.

ITEM NO. 7.—Regional Committees**(A) Matters for Reports****(B) Recommendations for Consideration****I. WESTERN REGIONAL COMMITTEE****(A) MATTERS FOR REPORTS****Meetings**

1. The Committee held two meeting on 14th December, 1960 and 21st April, 1961 respectively.

2. The Committee observed that the model list of equipment for polytechnics prepared by the Lala Shri Ram Committee were based on the National Certificate courses. Since these courses were not being followed as such in the Region, the list should be revised to suit the requirements of State Diploma courses conducted in Madhya Pradesh, Maharashtra and Gujarat States. The Regional Committee revised the list accordingly and estimated the cost for each State as shown below :

<i>Madhya Pradesh</i>	Rs. 9,80,500
<i>Maharashtra and Gujarat</i>	Rs. 9,91,771

The estimate of cost of the Lala Shri Ram Committee list is Rs. 10.90 lacs.

Degree courses for Diploma holders

3. The All India Council for Technical Education at its meeting held on 13-4-1959 had recommended that Universities be requested to formulate degree courses for the benefit of those who had passed the National Certificate course or equivalent State Diploma courses. The Western Regional Committee considered this recommendation and suggested that in view of the preference of candidates to University degrees the possibility of organising special degree courses for diploma holders should be examined instead of organising part-time National Diploma Advanced State Diploma courses.

4. The Regional Committee after examining the admission requirements of different universities in its area has now recommended that holders of State Diplomas and National Certificates at least in the Second Division may be considered eligible for admission to university degree courses. Where the 5-year integrated degree courses are

being conducted, the candidates should be put through a special preparatory course of one year common to all branches and after that admitted to the fourth year of the degree course. As regards universities conducting the 4-year degree courses, the candidates may be admitted to the third year but they should pass before the end of that year, an examination in Mathematics as prescribed for the second year of the normal course. Similarly where universities are conducting three year degree courses, the candidates may be admitted to the second year but they should pass before the end of that year an examination in Mathematics as prescribed for the first year of the normal course.

5. The Regional Committee further suggested that this scheme should be introduced on an experimental basis at an institution or two in the region in order to assess its practicability and other results.

(B) MATTERS FOR DECISION

**Sir Cusrow Wadia Institute of Electrical Technology,
Poona**

1. This institution was first approved in 1955 for the development of diploma courses in Electrical Technology and Radio Engineering at a cost of Rs. 6.06 lacs (Rs. 2.38 lacs for buildings and Rs. 3.68 lacs for equipment). In 1957, the institution was approved for further development of the then existing courses as also for starting diploma course in Civil Engineering with an intake of 60 students. The establishment of Civil Engineering diploma course was under the Centrally-sponsored Expansion Programme. In February, 1960 supplementary estimates were also approved for this purpose. The total estimates approved in 1957 and 1960 in respect of the normal development and Expansion Scheme are as follows :—

	Normal Develop- ment	Expansion Scheme
	Rs.	Rs.
Buildings	Nil	1,46,191
Equipment	1,07,561	1,59,000
	1,07,561	3,05,191

2. The Chairman, All India Council for Technical Education, authorised the institution in August, 1960 to start diploma course in Mechanical Engineering with an annual admission of 30 students, but after decreasing the admissions to Civil Engg. course from 60 to 30 students. The institution admits at present 140 students annually (Civil Engg. 60; Mech. Engg. 30; Elect. Engineering 30 and Radio Engg. 20). The Regional Committee has now furnished estimates of cost for the introduction of diploma course in Mechanical Engg. as shown below :

<i>Non-recurring</i>	Rs.
Equipment, Library and Furniture	85,000
<i>Recurring</i>	7,845

Thus the total estimates of cost approved for the institution both under normal development and Special Expansion Programmes are as shown below :

<i>Non-recurring</i>	Rs.
Buildings	1,46,191
Equipment	3,51,561
<i>Recurring</i>	1,52,845

St. Xavier's Technical Institute, Bombay

3. This institution was approved in 1957 for the development of State Diploma Course in Radio Engineering and State Certificate Course in Sound Engineering at an estimated non-recurring cost of Rs. 6,89,500 (Building—Rs. 5,30,700 ; Equipment, library and furniture—Rs. 1,58,800). The Scheme however, could not be implemented on account of certain difficulties experienced in securing a site for the construction of the Institute buildings. The existing site was considered thoroughly unsuitable for the purpose. The site has now been made available and the Institute is anxious to implement the development programme. Meanwhile, however, the syllabus for the State Diploma Course in Radio Engineering has been revised and as a result the Institute has asked the Regional Committee to review the estimates of cost of the development programme. The regional Committee has now furnished the following revised estimates for the approval of the Council :

	Rs.
Building (Plinth Area—26535 sq. ft.)	5,30,700
Equipment, library and furniture	1,30,200
TOTAL	6,60,900

Kilachand Devchand Polytechnic, Patan

4. The Second Five-Year Plan of the former Bombay State included four polytechnics of which three were established at Karad, Sholapur and Dohad. On the reorganisation of the State, these three polytechnics came to be in the present Maharashtra State. Therefore the provision made for the fourth polytechnic was transferred to the present Gujarat State and the polytechnic was started at Patan in 1960-61 academic year with Civil Engineering diploma course. The Regional Committee has now formulated a detailed scheme for this polytechnic that will have an admission capacity of 120 students for Civil, Mechanical & Electrical courses. The estimates of cost of the scheme are as given below :

<i>Non-recurring</i>	Rs.
Buildings (plinth area 54,582 sq. ft.)	9,25,000
Equipment, library and furniture	11,30,271
TOTAL	20,55,271
 <i>Recurring</i>	
Ceiling	2,60,172
Hostel for 180 students	5,77,500

5. The Regional Committee recommended that the State Government should not increase the admissions to the Civil Engineering course beyond 60 students nor should it start diploma courses in Mechanical and Electrical Engineering till the Regional Committee is satisfied that instructional facilities for these courses are adequately provided.

Government Polytechnic, Broach

6. The State Government of Gujarat after adjustments within its Second Five Year Plan and with the concurrence of the Central Government provided for the establishment of a polytechnic at Broach. The polytechnic, however, did not start in 1960-61. The Regional Committee has recommended the establishment of the institution in 1961-62 for a total annual admission of 120 students for diploma courses in Civil, Mechanical & Electrical Engineering. The Regional Committee also estimated the cost of the scheme as shown below :

<i>Non-recurring</i>	Rs.
Buildings (Plinth area 54,582 sq. ft.)	9,14,200
Equipment, library and furniture	11,30,271
TOTAL	20,44,471

<i>Recurring</i>	Rs.
Ceiling	2,60,172
Hostel	5,77,500

The Regional Committee has recommended that the Polytechnic should not increase the admissions to the Civil Engineering course, nor should it start Mechanical & Electrical courses till the Committee is satisfied that the necessary instructional facilities have been provided.

Sir Bhavsinhji Polytechnic Institute, Bhavnagar

7. The Council at its meeting held on 22-2-57 approved the development of this institution for diploma courses in Civil, Mechanical, Electrical and Automobile Engineering with an annual admission of 60, 30, 30 and 30 students respectively. In sanctioning the estimates of cost of the scheme, Council laid down the condition that the then existing diploma course in the technology of Oils, Paints and Soaps should be discontinued and the diploma course in Textile manufacture be transferred to the R.C. Technical Institute, Ahmedabad. The State Government accepted the former but represented that in view of the improved position regarding admissions to the textile technology diploma course, the second condition should be waived. The Regional Committee has now recommended that the transfer of the textile course might be deferred for a period of three years. During this period, the State Government should take adequate measures as suggested by the Regional Committee to improve of the course.

Establishment of a Government Polytechnic at Bombay under the expansion scheme

8. Under the Centrally-sponsored scheme of expansion of technical education during the Second Plan Period, provision was made for the establishment of a polytechnic in the city of Bombay with an annual admission of 300 students. The State Govt. started the institution in June 1960 with 120 students admitted to diploma course in Civil Engg. The Western Regional Committee has now made the following estimates of cost for the complete project for an annual admission of 300 students (180 for Civil and 60 each for Mechanical and Electrical Engineering):

<i>Non-recurring</i>	Rs.
Buildings (Plinth 87,284 sq. ft.)	15,43,000
Equipment, furniture and library and audio-visual equipment	13,60,000

	Rs.
Office equipment and students' amenities	75,500
	29,78,500
<i>Recurring</i>	
Ultimate ceiling	5,65,308
Loan for hostels for 450 students	15,10,300

9. The Committee has recommended that the Polytechnic should neither increase the admissions to the Civil Engg. course nor start Mechanical and Electrical Engineering courses till the Committee is satisfied that adequate instructional facilities have been provided for the purpose.

Puranmal Lahoti Smarak Technical College, Latur

10. This institution was approved in April, 1959 for diploma course in Civil Engineering with an Annual admission of 60 students and at an estimated cost of Rs. 7,54,700 (N.R.). On a representation received from the institution that these estimates excluded equipment for R.C.C. laboratories, the Regional Committee examined the matter and recommended the necessary equipment for R.C.C. laboratories estimated at Rs. 15,070.

Government Polytechnic, Nagpur

11. This institution was formerly conducting a three-year post-matric diploma course in Automobile Engineering. In pursuance of the recommendation of the All India Council that Automobile Engineering should be offered as a post-Mechanical Engineering diploma course instead of a separate course, the State Government agreed to re-organise the course and requested assistance for the purpose. The Regional Committee has now estimated additional equipment of the value of Rs. 64,000 and additional recurring expenditure of Rs. 44,300 per year for the purpose.

Establishment of an Engineering College at Aurangabad

12. The Centrally-sponsored scheme of establishment of Regional Engineering Colleges, includes one College at Nagpur, which has started functioning prior to this an engineering college was started at Nagpur by the State Government under Second Five Year Plan. As a sequel to the

location of the Regional College there, the State Government with the concurrence of the Planning Commission and the Central Government decided to transfer the State College to Aurangabad together with the Plan provision. The Aurangabad College started in June '60 when 60 students were admitted to the Civil Engineering degree course. The Regional Committee has now estimated the cost of the Aurangabad College as shown below. The College has an annual admission capacity of 120 students (60 for Civil and 30 each for Electrical and Mechanical Engineering) :

<i>Non-recurring</i>	Rs.
Buildings (96,320 sq. ft. plinth)	13,75,000
Equipment, furniture & library	16,51,400
Office equipment and students' amenities	36,127
TOTAL	30,62,527
 <i>Recurring</i>	
Ultimate ceiling	4,12,152
Loan for hostel for 180 students	5,84,800

13. The Regional Committee has recommended that the College should neither increase admissions to the Civil Engineering course nor start courses in Electrical and Mechanical Engineering till the Committee is satisfied that the necessary instructional facilities have been provided.

II. NORTHERN REGIONAL COMMITTEE

(A) MATTERS FOR REPORT

Meetings

1. The Committee held two meetings on 29th December, 1960 and 26th April, 1961 respectively.

Standards of Instructional facilities for Diploma Institutions

2. As suggested by the All India Council the Regional Committee examined the standards of instructional facilities drawn up by the Lala Shri Ram Committee for degree and diploma institutions with a view to adopting them with minor modifications if necessary for institutions in the region. In so far as degree institutions are concerned, the Regional Committee accepted *in toto* the standards laid down by the Lala Shri Ram Committee and the All India Council for

Technical Education. As regards diploma institutions the Regional Committee has made the following modifications :

	Council's standard	Revised Standard of Regional
(i) Buildings	53,300 sq. ft. (plinth)	52,510 sq. ft. (plinth)
(ii) Equipment including library, furniture etc.	Rs. 13,25,500	Rs. 12,28,500
(iii) <i>Staff</i>		
Principal	1	1
Head of Deptts.	3	3
Lecturers	5	6
Workshop Supdt.	1	1
Instructors (Maths, Science etc.)	2	4
Senior Drawing Instructors	2	5
Demonstrators etc.	7	10
Workshop Instructors	7	9
Draftsmen.	3	1

(B) MATTERS FOR DECISION

Staff for Diploma Institutions

1. In view of the deteriorating standards in high schools generally in all subjects and particularly in English and on account of a sudden change in the medium of instruction from Hindi in high schools stage to English in technical institutions, the Regional Committee recommended that the existing provision of a part-time teacher for English in diploma institutions should be changed to a full time lecturer. Although English is prescribed only in the first year of diploma course (86 hours of lectures and tutorials out of the total of 1150 hours for all subjects) the need for whole time staff for English should not be related strictly to the teaching load involved.

Development of Four Diploma Institutions in Uttar Pradesh

2. The former *ad hoc* Board of Engineering Education, Uttar Pradesh affiliated a large number of sub-standard engineering schools which had neither proper instructional

facilities nor the resources required to build them. When the recognition of the diplomas of these institutions came up for consideration before the Assessment Board in April, 1959, the Board took a serious view of the situation and decided that for their future recognition the State Government should select deserving institutions and develop them according to correct standards. The rest of the institutions which cannot be developed should be closed down. The State Government accepted the recommendation of the Assessment Board and made provision in its Third Five Year Plan for the development of four of these institutions. The Regional Committee was requested to inspect the institution and formulate the necessary schemes for their development.

3. The Regional Committee has recommended that the institutions at Muzzafarpur, Meerut and Ballia should be taken over by the State Government & developed as State institutions and institution at Allahabad should be developed as a private institution but with assistance provided by the Central and State Governments. Each of these four institutions should be a full fledged polytechnic capable of admitting 120 students (60 for civil, 30 for electrical and 30 for mechanical). The remaining institutions should be closed down. The Committee has also made the following estimates of cost for the development of these institutions :

(a) **Gandhi Engineering Institute, Muzzafarnagar**

<i>Non-recurring</i>	Rs.
Buildings (40,729 sq.ft. plinth)	6,09,720
Equipment, library and furniture	12,61,815
	18,71,535
<i>Net-recurring</i>	
Ceiling after providing for tuition fees	2,17,800
Hostel for 180 students	4,55,600

(b) **D. N. Technical Institute, Meerut**

<i>Non-recurring</i>	Rs.
Buildings (52,650 sq. ft. plinth)	7,19,350
Equipment, Library and furniture	12,15,375
	19,34,725
<i>Net-recurring</i>	
Ceiling after providing for tuition fees	2,22,800
Hostel for 180 students	4,57,200

(c) Engineering School, Ballia

<i>Non-recurring</i>	Rs.
Buildings (55,650 sq.ft. plinth)	7,19,350
Equipment, library & furniture	12,29,029
	19,48,379
<i>Net-recurring</i>	
Ceiling after providing for tuition fees	2,22,800
Hostel for 180 students	4,57,200

(d) Engineering School, Allahabad

<i>Non-recurring</i>	
Buildings (33,873 sq.ft. plinth)	4,68,815
Equipment, library & furniture	9,38,730
	14,07,545
<i>Net-recurring</i>	
Ceiling after providing for tuition fees	2,22,800
Hostel for 180 students	4,52,400

The Regional Committee has also recommended that the institutions at Muzzafarnagar, Meerut and Ballia should not admit fresh students till the State Government has taken them over for development.

Guru Nanak Engineering College, Ludhiana

4. Consequent on the introduction of five-year integrated degree courses the student enrolment has increased by 120 at this College. The Regional Committee has therefore recommended that additional hostel accommodation for 60 students be provided at a cost of Rs. 1,72,200.

Birla College of Engineering, Pilani

5. At its 29th meeting held on 1st March, 1960 the Co-ordinating Committee considered the recommendations of by the Regional Committee regarding provision of high voltage laboratory at this College and asked the Regional Committee to re-examine the matter in the light of reports received that the College has the necessary equipment for high voltage laboratory for undergraduate courses. The Committee accordingly re-examined the matter and recommended that additional equipment at a cost of Rs. 17,000 and additional buildings (1,000 sq. ft. floor area) at a cost of Rs. 27,000 should be provided for high voltage laboratory at this College.

Meharchand Polytechnic, Jullundur

6. This institution was approved for development in 1956, when an estimate of Rs. 20,000 was made for the library. On a request made by the Principal of the institution for a revision of the estimate in accordance with the current standards laid down by the All India Council, the Regional Committee has recommended an additional amount of Rs. 55,000 for the library.

Overseers Schools in U.P.—Provision of Audio-visual Equipment

7. The All India Council in 1959 approved the establishment of three State Diploma institutions at Chandauli, Handia and Nainital. In the estimates of cost approved for these institutions, no provision was, however, made for audio-visual equipment. The State Government requested the Regional Committee to include this provision also. The Regional Committee has recommended that an amount of Rs. 8,000 may be approved in respect of each institution for audio-visual equipment.

University Polytechnic, Muslim University, Aligarh

8. This institution was approved sometime back for Draftsmanship courses (with an annual intake of 40 students) to be conducted as an additional activity. An *ad hoc* recurring grant of Rs. 8,000 per year was also approved for the purpose. The Regional Committee has since formulated standard instructional facilities for Draughtsmanship courses. The University requested the Committee through the University Grants Commission, to reassess the requirements of the institution for conducting the Draughtsmanship courses in accordance with the prescribed standards. The Regional Committee has made the following revised estimates :

	Rs.
Buildings (4,093 sq.ft. plinth)	64,600
Recurring per year	13,000

The Committee has also recommended that the annual admission should be increased from 40 to 60 students after the above instructional facilities have been provided.

Technological Institute of Textiles, Bhiwani

9. The request of this institution for financial assistance in its development programme came through the State Government of Punjab. The State Government, however, made it clear that they would not be in a position to share any part

of the expenditure involved, but the Birla Education Trust which has ample resources would meet the entire non-Central portion of recurring and non-recurring estimates of cost in accordance with the current pattern.

10. The Regional Committee has now recommended that the institution should have an intake of 60 students only for the University degree course in Textile Technology and that it be provided with additional instructional facilities as estimated below :

	Rs.
Buildings (18,326 sq.ft. plinth)	1,83,260
Equipment	8,50,300

Diploma Institutions in the Region—Revision of estimates of Cost

11. In the light of the latest standards of instructional facilities formulated by the Regional Committee, the estimates of 21 institutions in the region made earlier on the then existing standards have been revised. The revised estimates of these institutions are shown below :—

Particulars of the scheme	Building grant		Equipment grant		Recurring grant		Remarks
	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
<i>Uttar Pradesh</i>							
1. Establishment of a Government Polytechnic at Muzaffarnagar by taking over the Gandhi Engineering Institute.	6,09,720	6,07,620	12,61,815	11,93,315	2,17,800	1,97,550	
2. Establishment of a Govt. Polytechnic at Meerut by taking over the D. N. Technical Institute.	7,19,350	7,17,250	12,15,375	11,46,875	2,22,800	2,02,550	
3. Development of Civil Engineering School, Allahabad.	4,68,815	4,66,715	9,38,730	8,94,230	2,22,800	2,02,550	
4. Establishment of a Govt. Polytechnic at Ballia, by taking over the civil Engineering School,	7,19,350	7,17,250	12,29,029	11,60,529	2,22,800	2,02,550	

Particulars of the scheme	Building grant		Equipment grant		Recurring grant		Remarks
	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
5. Establishment of a big size Polytechnic at Kanpur with an intake of 240.	12,05,400	10,81,500	13,90,250	15,78,100	5,36,050	4,58,200	
6. Establishment of a Polytechnic at Faizabad.	8,17,005	7,17,250	8,85,200	12,28,500	3,09,200	2,88,950	
7. Establishment of a Polytechnic at Mirzapur.	8,17,005	7,17,250	8,85,200	12,28,500	3,09,200	2,88,950	
8. Development of Murlidhar Gajanand Polytechnic, Hathras.	..	..	8,79,590	12,22,890	..	..	No change in the building grant and recurring grant is necessary.
9. Establishment of Seth Ganga Sagar Jatiya Technical Institute, Khurja.	..	..	8,85,200	12,28,500	..	..	Ditto.

10. Introduction of diploma courses in Electrical and Civil Engineering at the P.M.V. Technical Institute, Mathura.	..	..	4,30,500	6,18,700	..	..	Ditto.
11. Introduction of Electrical & Mechanical Engineering courses at the Hewett Polytechnic, Lucknow.	..	..	5,43,500	8,42,800	..	..	Ditto.
12. Introduction of Electrical & Mechanical Engineering courses at the Hindu Education Society Polytechnic, Lucknow.	..	..	5,43,500	8,42,800	..	..	Ditto.

Punjab

1. Establishment of a Polytechnic at Sirsa.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
2. Establishment of a Polytechnic at Batala.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
3. Establishment of a Polytechnic at Guru Tegh Bahadur Garh.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750
4. Establishment of a Polytechnic at Jhajjar.	7,19,350	7,17,250	8,90,000	12,28,500	2,66,000	2,45,750

Rajasthan

1. Establishment of a new Polytechnic at Kotah.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050
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Particulars of the scheme	Building grant		Equipment grant		Recurring grant		Remarks
	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	Previous recommendation	Revised recommendation	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
2. Establishment of a new Polytechnic at Alwar.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050	
3. Establishment of a new Polytechnic at Bikaner.	8,07,000	7,17,250	8,85,000	12,28,500	2,63,300	2,43,050	
4. Introduction of Electrical and Mech. Engineering courses at the Ajmer Polytechnic, Ajmer.	8,17,005	7,17,250	5,43,515	8,42,800	2,63,300	2,43,050	
<i>Himachal Pradesh</i>							
1. Establishment of a Government Polytechnic at Sundernagar (Mandi).	8,17,005	7,17,250	8,85,200	12,28,500	2,31,440	2,11,190	

12. In these revised estimates, the cost of buildings and recurring expenditure is lower than the earlier estimates. The revised estimates of cost for equipment in respect of five institutions is lower than the earlier estimates, the difference in each case being of the order of Rs. 60—70,000. These institutions have actually been approved after the revised standards were available. Revised estimates of equipment in respect of the remaining 16 institutions are in excess of the earlier estimates, the excess in each case being of the order of Rs. 3 to 3.5 lacs. The reason given by the Regional Committee for this excess is that the estimates of these institutions were approved long before the revision of standards and the institutions have already been purchasing equipment on the basis of the old standards. When the new standards of equipment were available, they have been asked to procure equipment in accordance with the revised standards. Thus, these 16 institutions would be having some items of equipment not covered by the revised standards but provided in the earlier ones.

Meharchand Polytechnic, Jullundur

13. In accordance with the revised estimates of cost of diploma institutions, the Committee has recommended an amount of Rs. 5,000 for this institution for the purchase of office equipment.

Replacement & Alteration of Equipment for Adoption of Metric System

14. The Regional Committee considered the request of the Guru Nanak Engineering College for an additional amount of Rs. 51,172 for the replacement of some items of equipment and for the alteration of other items to facilitate the introduction of the Metric system in the College. The Committee expressed the view that since this was a general question affecting all technical institutions in the country, the matter should be examined by the Co-ordinating Committee and the All India Council in the first instance.

III. EASTERN REGIONAL COMMITTEE

(A) MATTERS FOR REPORT

Meetings

The Committee held a meeting on 10th February, 1961.

(B) MATTERS FOR DECISION

Film Library

1. The Committee recommended the establishment of a technical film library in the Eastern Regional Office at an estimated cost of Rs. 94,000 non-recurring and Rs. 18,920 recurring.

Standards of Instructional Facilities

2. The All India Council for Technical Education has laid down recently standards of instructional facilities required for Polytechnics on an all-India basis. These standards have had to be adapted by the Regional Committees after suitable modifications wherever necessary to suit the conditions prevailing in their respective areas. Accordingly, the Eastern Regional Committee has formulated the revised standards for Polytechnics as shown below. These standards apply to institutions with an admission capacity of 180 students which is the standard admission pattern followed in the institutions in the region.

Non-recurring

(a) Accommodation Main instructional building including 40% for passage etc.	46,508 sq. ft.
(b) Heat engine Lab. and workshop including 10% for passage etc.	19,195 sq. ft.
TOTAL	65,703 sq. ft.
	Rs.
(c) Equipment, library & Furniture	11.83 lacs.
(d) Recurring (net deficit)	2.91 lacs.

Development of the College of Textile Technology, Berhampur

3. In 1953, the Government of West Bengal submitted a scheme for the development of two Institutes of Textile Technology at Berhampur and Serampur for degree courses in this field. In order to consider the scheme in detail the Board of Technical Studies in Textile Technology appointed a Visiting Committee which recommended that in view of the meagre development of textile industry in the region these institutions should not be developed for higher training but should be developed for diploma courses. Before the report of the Visiting Committee was considered by the Board and by the All India Council the State Government withdrew its original scheme.

4. Again in 1959, the State Government submitted schemes for the reorganisation of the Colleges of Textile Technology at Berhampur and Serampur. The schemes

were considered by the Eastern Regional Committee which on the report of its Expert Committee recommended the development of both institutions for degree courses in textile technology. These recommendations of the Regional Committee were considered by the Co-ordinating Committee at its meeting held in March, 1960. The Co-ordinating Committee observed that in view of the present state of development of textile industry in the Eastern Region it did not seem necessary to develop both Berhampur and Serampur institutions for degree courses in textile technology. Further there will be much duplication of instructional facilitation between the two institutions, if degree courses were conducted at both centres. In this connection, the Co-ordinating Committee also referred to the views expressed by the Expert Committee of the Textile Board in 1953-54 *viz.* due to the meagre development of textile industry in the region and limited scope of employment of textile technologists of degree standard the Berhampur and Serampur Institutes need not be developed for degree courses. The Co-ordinating Committee, therefore, decided that the development of only one Institute *viz.* Serampur Institute should be undertaken for the present. As regards the development of the Berhampur Institute, the Co-ordinating Committee decided to remit it back to the Regional Committee for re-examination.

5. The Regional Committee decided to examine the matter further to find out the necessity or otherwise of having a second College of Textile Technology in the region on the basis of the following factors :

- (i) The present requirements for personnel at degree level ;
- (ii) Possible development of textile technology in the near future and the requirements for personnel for the purpose.
- (iii) Other employment opportunities.

The Committee collected the necessary data from the textile industry in the region which though not exhaustive, revealed the trend of requirements in the industry *viz.* an increasing necessity for more graduates as a result of industrial expansion in the textile field. The Committee also noted that the Bengal Millowners Association, though not in a position to submit any definite opinion about the probable requirements for degree holders, had suggested that the technical know-how in so far as education in textile technology was concerned, should be improved. The Committee held that the increased activity in the textile industry would naturally

require larger numbers of technical personnel who are acquainted with modern machinery and newer methods of production and quality control. The Committee was of the view that in the context of increased tempo of industrial activity, emphasis should be laid down on discovering better methods of production and capturing unexplored markets by planned research in specialised fields. In support of its argument, the Committee cited the example of jute industry and stated that this industry was entirely dependent on the export market which was slowly dwindling and, therefore, it was all the more necessary to find out ways and means of using jute in the internal market. This would require technical personnel possessing specialised knowledge of jute technology after the conventional degree courses. The situation was similar in respect of silk and wool industry. There are at present 45 cotton textile mills, 18 silk mills and 46 jute mills in the Eastern Region and the number of such mills is likely to increase in the near future. The Committee, therefore felt that there was a necessity for more textile graduates in the Eastern Region. The Committee also observed that on the same basis as indicated above there was a growing demand for diploma holders also. The Committee did not agree with the view that the diploma holders would compete with graduates in respect of employment and, therefore, suggested that there was ample scope for the diploma courses as well. The Regional Committee finally recommended that the diploma courses in textile technology should be reintroduced in the College of Textile Technology, Berhampore as a special case. The only admission to the institution should be as shown below :

Degree	20 students.
Diploma	30 students.

The Committee also recommended that its earlier assessment of the requirements of the College would be sufficient to meet the present need. The earlier assessment is as given below:--

<i>Non-recurring</i>	Rs.
(i) Accommodation (60,000 sq.ft. @ Rs. 15 per sq.ft.)	9.00 lacs.
Humidification Plant	0.50 lacs.
(ii) Equipment, Library & Furniture	5.50 lacs.
	<hr/> 15.00 lacs.
<i>Recurring (Net deficit)</i>	2.05 lacs.
Loan for Hostel (90 students)	2.83 lacs.

6. The Regional Committee has stated that the Institution has grown up in a very unplanned manner and most of its departments were housed in a building of about 200 years old which was used as military barracks and completely unsuitable for an educational institution, the college should be shifted at the site earmarked for hostel and already acquired. This site being situated on the high way and having an area of about 9 acres would be highly suitable for the main building as well as the hostel and staff quarters.

Establishment of a new Polytechnic at Bolangir

7. The Government of Orissa has included in its Third Five Year Plan, a scheme for the establishment of a new polytechnic at Bolangir and has submitted a detailed proposal for consideration of the All India Council for Technical Education. The Regional Committee has recommended the establishment of the polytechnic for conducting diploma courses in Civil, Mechanical and Electrical Engineering with an annual admission capacity of 120 students and has assessed the requirements of the institute as under :—

<i>Non-recurring</i>	Rs.
Buildings (53,810 sq.ft.)	7.59 lacs.
Equipment, Library & Furniture	7.55 lacs.
<i>Recurring</i> (Net deficit ceiling)	1.48 lacs.
 <i>Loan for Hostels</i>	
Hostel for 180 students (50% of the total student strength)	4.43 lacs.

8. The assessment made by the Regional Committee in respect of buildings, equipment, library and furniture is within the standards prescribed by the All India Council for Technical Education for a similar institution. The staff recommended by the Regional Committee is slightly at variance with the Council's standards. As regards loan for hostels, the amount per student recommended by the Regional Committee is within the rate generally approved by A.I.C.T.E. for this purpose, but the Regional Committee has not indicated the plinth area per student and other details of the Hostels.

To Consider the report of the Standing Committee of the Eastern Regional Committee on the progress of Institutions

9. The All India Council for Technical Education in its 11th meeting held on 24th March, 1958 decided that the Regional Committees should set up Standing Committees to watch

the progress of the schemes in the respective regions and to bring to the notice of the Regional Committees cases of institutions where the progress is not satisfactory, so that the Regional Committees might suggest measures for expediting implementation of the schemes.

10. The Eastern Regional Committee in accordance with the above appointed its Standing Committee consisting of Shri N. K. Mitra, Shri B. N. Chowdhury, Dr. A. C. Roy, Dr. T. Sen and Shri N. C. Chakravarty. This Committee met on 26th May, 1961 and reviewed the progress of development in the institutions in Bihar Orissa and West Bengal. The Chairman, Eastern Regional Committee, Shri J. J. Ghandy, was in full agreement with the recommendations of the Standing Committee and forwarded its report (Annexure XVII) to be placed before the meeting of the All India Council for Technical Education. Shri Ghandy has also stated that earlier, on the recommendation of the Regional Committee, he had taken up the unsatisfactory situation of admitting students without providing minimum facilities to institutions in Bihar, with the late Chief Minister, Dr. S. K. Sinha and later with Pandit Binodanand Jha, the present Chief Minister. Unfortunately the situation did not improve. Similar state of affairs has also been noticed in institutions in other States.

IV. SOUTHERN REGIONAL COMMITTEE

(A) MATTERS FOR REPORT

Meetings

1. The Committee held two meetings on 21st November, 1960 and 8th March, 1961.

Conditions for Expansion of Institutions

2. The Committee recommended that in the interests of economy the existing institutions should be expanded in order to meet demands for additional personnel but no institution which does not possess adequate instructional facilities for the existing courses should be expanded.

Girls' Polytechnics

3. The Committee expressed the view that for these polytechnics, employment of women teachers is both advisable and desirable. In order to train women teachers for the polytechnics, stipends for women to join existing technical

institutions should be instituted and only when an adequate number of women teachers were available, should the establishment of the women's polytechnics be undertaken.

Industrial Management Course

4. The Committee observed that a proposal for starting a part-time course in Industrial and Business Management at the P.S.G. College of Engineering and Technology was being directly dealt with between the Ministry of Scientific Research and Cultural Affairs and the Institution. The Regional Committee felt that it would be appropriate if such proposals were initially considered at the level of State Governments and Regional Committee concerned.

(B) MATTERS FOR DECISION

Admissions to Technical Institutions

1. The Regional Committee made the following recommendations in respect of admissions to technical institutions in the region :

(a) There should be no reservation of seats on district-wise or regionwise basis.

(b) Children of Central Government employees, employees of private and public enterprises though not residents of the particular State should be admitted on the basis of merit to technical institutions in the State provided that such candidates possess Higher Secondary Certificate from one of the institutions in that State.

(c) Scheduled castes and scheduled tribes students to be admitted in the quota reserved for them should have at least 90 per cent of the total marks secured by the last candidate admitted to the general seats.

(d) The earlier recommendation in respect of a minimum age of 16 and maximum age of 21 be modified to the extent that relaxation should be given in the upper age limit in deserving cases.

(e) In view of the fact that the method of interview having not been well established, the number of marks allowed for interview should not exceed 15% of the total.

Maintenance Grant

2. The maintenance expenditure should continue to be assessed at the rate of Rs. 100 per student per year.

Instructional Facilities

3. The Regional Committee examined the list of instructional facilities prepared by the Lala Shri Ram Committee and suggested modifications for the adoption of the list to suit institutions in the region. The adopted standards recommended by the Regional Committee for Polytechnics and Engineering Colleges are as given below :

(a) **Polytechnics**

Particulars	Approved by the Council	Modified by Regional Committee
<i>Non-recurring</i>		
Building	53,300 Sq.ft. plinth.	54,200 Sq.ft. of plinth area.
	Rs.	Rs.
*Equipment Library & Furniture	13,25,505	13,76,000

*For polytechnics in Madras and Mysore an additional provision of Rs. 23,100 and Rs. 34,600 respectively has also been made.

Recurring

Staff salaries, maintenance and Library. Rs. 3,05,000

4. The variation in the staff recommended by the Council and modified by the Regional Committee is as follows :

Designation	As approved by Council	As recomen- ded by Regio- nal Commit- tee.
Principal	1	1
Head of Depts.	3 (Civil 1, Mech. 1, Elect. 1)	3 (Civil 1, Mech. 1, Elect. 1)
Lecturers	5 (Civil 2, Mech. 2, Elect. 1)	5 (Civil 2, Mech. 1, Elect. 1, Maths 1).
Workshop Superintendent	1	1
Instructors (Math, Science, Etc.)	2	10
Senior Drawing Instructors or Head Draftsmen	2	

Designation	As approved by Council	As recommended by Regional Committee
Demonstrators or Engg. Instructors	7	8
Asstt. Instructors or Workshop Instructors	7	6
Draftsmen	3 (Civil 1, Mech. 1, Elect. 1)	2 (Civil 1, Mech./Elect. 1)

(b) Engineering Colleges

Particulars	Approved by the Council	Modified by Regional Committee
<i>Non-recurring</i>		
Buildings	1,22,000 Sq.ft.	1,24,200 Sq.ft.
	Rs.	Rs.
*Equipment, Furniture & Library	24,84,000	29,04,818
(*For Institutions affiliated to the University of Madras, an additional provision of Rs. 41,200 and Rs. 15,000 for list B is also essential. For Institutions in all the States in the region, an additional amount of Rs. 3,05,365 is recommended in List B.) :		
<i>Recurring</i>		
Staff salaries & maintenance		Rs. 7.9 lacs.

Loans for the Hostels

5. The Committee recommended loans for the construction of hostels for the following five institutions as shown against each :

Sl. No.	Name of the Institution	Annual Admissions	No. of students for whom hostel accom. exists	Additional hostel accommodation now recommended	Amount of Loan
1	Govt. Polytechnic, Belgaum.	120 (for Diploma Course.) 120 (for 5 years integrated course).	..	180	Rs. 4.52 lacs.
2	Govt. Poly., Karwar.	Do.	..	180	4.52 lacs.

Sl. No.	Name of the Institution	Annual Admissions	No. of students for whom hostel accom. exists	Additional hostel accommodation now recommended	Amount of Loan
3	Govt. Poly., Chickmagalur.	120 (for Diploma Course.) 120 (for 5 years integrated course).	..	180	Rs. 4.52 lacs.
4	B.V.B. College of Engg. Hubli	Do.	164	314	3.74 lacs.
5	N.S.S. Poly., Pandalam.	Do.	120	120	3.06 lacs.

6. The scale of accommodation provided is according to the latest standards laid down by the Ministry in all cases excepting N.S.S. Polytechnic, Pandalam. The total hostel accommodation does not exceed 50 per cent of the total student-enrolment. N.S.S. Polytechnic will, however, have hostel accommodation for 66.6 per cent of its students enrolment. The Regional Committee has recommended extra hostel accommodation at Pandalam Polytechnic due to the local conditions in this place.

Additional estimates for furniture to Diploma Institutions

7. The Regional Committee in its revised standards of instructional facilities for diploma institutions has raised the estimates for furniture from Rs. 35,000 to Rs. 62,000. As a sequel the Committee has recommended additional amounts for furniture for the following institutions :

	Rs.
1. Annamalai Polytechnic, Chettinad.	27,600
2. A.M.M. Polytechnic, Ayadi .	27,600
3. Alagappa Polytechnic, Karaikudi .	14,700
4. D.A.C.G. Polytechnic, Chickmagalur .	14,830
5. Nachimuthu Polytechnic, Pollachi .	27,600
6. Seshasayec Institute of Technology, Tiruchirapalli .	16,255
7. M.V.M. Polytechnic, Tanuku .	27,600

Starting of Government Polytechnic at Srikakulam

8. The Third Five-Year Plan of Andhra Pradesh includes the establishment of a Polytechnic at Srikakulam.

The Regional Committee has approved the location and made the following estimates of cost for the institution that will have an annual intake of 120 students (Civil—40, Mech.—40, Elect.—40).

<i>Non-recurring</i>	Rs.
Buildings (54,200 sq.ft.)	7,86,240
Equipment, Library & Furniture including office equipment	21,62,197
<i>Recurring</i>	
Salaries and maintenance	3,05,000

Girls' Polytechnics at Kakinada & Hyderabad

9. The Third Five-Year Plan of Andhra Pradesh includes provision for the establishment of two technical institutions for girls. The State Govt. has proposed that the institutions be established at Kakinada and Hyderabad, each with an annual intake of 90 students for training in Electronics, Civil Engineering Draftsmanship and Secretarial Practices. The Regional Committee has, however, recommended that in the interests of economy, each institution should offer all the six courses given in the model scheme with annual admission of 200 students. The Regional Committee has also recommended the following estimates of cost for the full range of six courses at each institute :

<i>Non-recurring</i>	Rs.
Buildings (41,800 sq.ft. plinth)	5.01 lacs.
Equipment, furniture & library	6.00 lacs.
<i>Recurring</i>	
Staff, maintenance, stipends and scholarships	6.00 lacs

Loans for Hostels

10. The Committee has recommended interest free loans for the construction of hostels for the following institutions :—

Name of Institution	Annual admissions	No. of students for whom hostel accommodation has been recommended	Amount of loan Rs.
Malnad College of Engg., Hasan	120	204	5.00 lacs.
Srinivasa Subbaraya Poly., Sirkali	120	180	4.52 lacs.
*Hyderabad Poly., Hyderabad	120	180	4.52 lacs.

*This has since been approved by the Chairman, All India Council or Technical Education.

Madras Institute of Technology, Madras

11. The Council in the year 1957 approved an estimate of Rs. 1,90,000 for the construction of a building with 12,500 sq. ft. plinth area for the automobile engineering faculty of this institution. The institution made certain savings out of this and requested for 20,000 rupees from out of this saving to be spent on furniture. The Regional Committee examined this request and recommended Rs. 19,200 for the acquisition of furniture by the automobile engineering faculty.

ITEM NO. 8.—To consider the question of scales of Fees to be prescribed for technical institutions

1. The Co-ordinating Committee at its 31st meeting held on 1st November, 1960 considered the question of Scales of Fees charged by technical institutions in the country and observed that the fees charged varied widely from State to State. It also varied widely between government and non-government institutions within the same State. The Committee expressed the view that in the interests of students there should be some uniformity in the scales of fees and decided that the Regional Committees should collect detailed information from the institutions, examine the situation in each region and make suitable recommendations regarding uniform scales of fees to be charged by government and non-government institutions in their respective areas.

2. The Northern and Southern Regional Committees at their meetings held on 26th April, 1961 and 8th March, 1961 respectively examined the information relating to institutions in their respective areas. The Western Regional Committee has appointed a Sub-Committee for the same purpose. Information on the action taken by the Eastern Regional Committee is awaited.

3. In the Northern Region, there is no variation in the tuition fee charged by non-government institutions within the same State. The Committee has, however, observed that Rs. 450 p.a. charged as tuition fee by the Birla College of Engineering, Pilani is too high. The Committee has made the following recommendations :—

- (i) At the degree level institutions should not charge tuition fee of more than Rs. 360 p.a.
- (ii) At the diploma level institutions should not charge tuition fee of more than Rs. 240 p.a.

- (iii) The fee should be realised in not less than three instalments ; and
- (iv) The authorities of Birla College of Engineering, Pilani should be requested to reduce the tuition fee.

4. The fees charged by institutions in Southern Region for degree and diploma courses varies from State to State and from institution to institution in the same State. The range of variation is Rs. 175 to Rs. 600 in Colleges and Rs. 90 to Rs. 260 in Polytechnics per annum, that include both tuition fees and special fees. In view of the fact that Central Government assistance is being extended to both government and non-government institutions, the Regional Committee has recommended that no institution at degree level should charge tuition fee of more than Rs. 300 p.a. and a special fee of more than Rs. 150 p.a. Polytechnics should not charge tuition fee of more than Rs. 150 p.a. and a special fee of more than Rs. 80 p.a.

ITEM No. 9.—To receive a note on the decisions reached at the Conference of Chief Ministers on various aspects of technical education.

(A) 'Open Door Policy' regarding establishment of Technical Institutions by Private agencies

1. In 1957, the All India Council for Technical Education recommended on 'Open Door Policy' regarding Central assistance to private agencies in the establishment of new engineering institutions that provided as shown below :—

- (i) The private agency by itself or in association with the State Government concerned should meet at least 50% of the approved non-recurring cost, the balance being met from the grants to be given by the Central Government. Wherever the State Governments make a contribution that amount should be provided in its Five Year Plan.
- (ii) The private agency should have adequate resources including income from tuition fees to meet at least 50% of the approved recurring expenditure. The balance should be provided by the State Government and the Central Government in agreed proportions, subject to the condition that the State Government shall assume the entire responsibility after the current plan period.

2. Subsequently in 1958, the entire pattern of Central assistance to Technical Education Schemes was rationalised and the following pattern was adopted in respect of non-government institutions :

Non-recurring.—50% of the approved cost to be met by the Central Government and the balance 50% to be borne by the private agency itself or in association with the State Government concerned.

Recurring.—50% of the expenditure to be borne by the Central Government upto the end of the Second Plan period and the balance *viz.*, 50% upto the end of the second plan period and 100% after the second plan period to be borne by the private agency and the State Government.

3. In accordance with this policy, 10 engineering colleges and 23 polytechnics have been established in various parts of the country during the Second Plan period. The question of continuing or otherwise the 'Open door policy' during the Third Plan period was considered at a conference of Chief Ministers held in January, 1961. The Conference decided as given below :—

“After a careful consideration of all aspects of the matter, the Conference was unanimously of the view that the targets for the Third Five Year Plan should be at least 20,000 admissions for degree courses and at least 50,000 admissions for diploma courses. The 'Open door policy' initiated during the Second Plan had played a significant role in the expansion of Technical Education in the country. Private enterprise should be encouraged to play its due role also in the Third Plan but in view of the progress already attained and in order to check any unbalanced growth, a higher proportion of contribution by private agencies should be prescribed. The Conference agreed that for the Third Five Year Plan period, the following conditions should be prescribed in respect of institutions to be established by private agencies under the Open Door Policy :—

- (a) *Engineering Colleges.*—The private agencies concerned should provide at least 50% of the non-recurring expenditure. The other 50% of the non-recurring expenditure should be provided in equal parts by the Central Government and the State Government concerned.

As regards the recurring expenditure 25% would be provided by the Central Government upto the end of the plan period and the State Government in association with the private agency should provide the balance. After the plan period, the Central Government's share should be taken over by the State Government concerned either by itself or in association with the private agency. The income from tuition fees may be utilised by the State Government and private agency for meeting their share of the recurring expenditure.

- (b) *Polytechnics*.—The private agency and the State Government concerned should between themselves provide at least 60% of both the non-recurring and the recurring expenditure upto the end of plan period. The Central Government would provide the balance of 40% of the non-recurring and the recurring expenditure upto the end of the plan period. After the plan period, the Central Government's share of the recurring expenditure should be taken over by the State Government by itself or in association with the private agency. The income from tuition fees may be utilised by the State Government and the private agency in meeting their share of the recurring expenditure during and after the plan period.

The Conference agreed that institutions established by private agencies in accordance with the above formula may be in addition to engineering colleges and polytechnics established by the State Governments and the Central Government under the Third Five Year Plan.”

(B) Method of selection of candidates for admission to technical institutions

The All India Council for Technical Education at its meeting held in March 1958, considered the question of selection of candidates for admission to degree courses in engineering and technological institutions in the country. The Council recommended an all India admission test held regionally. The recommendations of the Council were communicated to all State Governments, Universities and other institutions for acceptance.

2. The comments received from the State Governments, Universities and other institutions were considered by the Co-ordinating Committee at its meeting held in November, 1960. The Committee expressed the view that pending a final decision on the question of a common admission test, the existing position in respect of the method of admission followed in different states should be improved immediately. The present position in most of the states is that each institution within a state makes admission individually and where there are several institutions in a particular state, the students concerned have generally to apply to all and appear for interview before the Selection Board of each institution which causes considerable hardship to the students. In addition, the standards of admission vary widely from institution to institution within the same state. Further the Selection Boards finalise the selection at different times which leads to various difficulties. It is, therefore, necessary that at least within a state, the selection to all the institutions should be made on a uniform basis at one time just before the commencement of the session. The Coordinating Committee, therefore, recommended that in each state a single Selection Board should be set up for selecting candidates for all institutions. For this purpose the seats of all the institutions should be pooled and admission to them made through the State Selection Board. The State Selection Board should include the principals or representatives of all the institutions concerned in addition to experts.

3. The question of holding a common admission test was also considered at the Conference of Chief Ministers of States held in January, 1961. The Chief Ministers agreed that in each state there should be a common agency for selecting candidates for admission to technical institutions in that state. For this purpose all the seats available in the institutions in the state should be pooled together and a State Selection Board should be set up for selecting candidates for admission. As regards the mode of selection the consensus was that in the interests of uniformity and other considerations, it will be helpful to have a common admission test for each state. Various details *viz.*, the manner in which the admission test should be held, the relative weightage that should be given to the admission test and University Entrance Examination would, however, have to be examined in detail. The Conference agreed that the State Governments should examine the matter and formulate proposals for holding a common admission test or any other suitable alternative

mode of selection. As regards admissions to all-India institutions, the conference accepted the scheme of holding a common examination for the four Higher Technological Institutes and other all-India Institutes. The results of this examination should be made available to all the Regional Colleges for making admissions to seats reserved as all-India quota.

4. As regards University institutions, the Chief Ministers recommended that the Universities being autonomous, the question of including them in the common admission examination should be examined further in consultation with the University Grants Commission.

5. The above recommendations of the Co-ordinating Committee and also of the Conference of the Chief Ministers have been communicated to all State Governments, with the request that they should formulate their proposals for the holding of state admission tests or for any other suitable alternative mode of selection. Since it would take some time for all the State Governments to formulate their concrete proposals, it has been suggested that each state should meanwhile, pool together all the seats available in its institutions, both Government and non-Government, and set a State Selection Board for selecting candidates for admission. As regards University institution the recommendations of the Chief Ministers Conference have been referred to the University Grants Commission for consideration.

(C) Shortage of staff at Technical Institutions and measures necessary to improve the position

The Co-ordinating Committee at its meeting held on 1st November, 1960 considered a report on the survey carried out on the shortage of teachers in technical institutions and expressed grave concern over the serious shortage of staff all over the country. The Committee recommended the following measures for improving the staff position at technical institutions :—

(a) The scheme of improved salary scales recommended by the Central Government should be implemented at all institutions to prevent the flight of existing teachers to non-teaching positions and to ensure a satisfactory recruitment of new teachers to vacant positions.

(b) The Teacher-Training Programme of the Central Government should be expanded in order to train a larger number of persons. The State Governments also should

implement similar schemes for the training of as many teachers as possible at their own institutions.

(c) Renewed efforts should be made to enlist the co-operation of industrial concerns and government departments in providing the services of their technical experts as part-time or full time teachers for technical institutions.

(d) New institutions should be established only when the existing ones have been adequately staffed. If in a particular State, the existing Government institutions are already having a serious shortage of staff, the State Government should not establish any new institution till the position at the former has improved. Similarly, if in a particular State, non-Government institutions are having a serious shortage of staff, no new institution in the private sector should start functioning till the position at the former has improved. Otherwise, the existing institutions will continue to be in an unsatisfactory state and the new institutions will face a worse situation.

2. The Survey Report together with the recommendations of the Co-ordinating Committee were considered by the Conference of Chief Ministers.

“The Conference agreed that the most important measure for improving the staff position at technical institutions is to implement the scheme of revised salary scales suggested by the Central Government. It was decided that all those States that had not yet accepted the scheme should give top priority to the matter and implement the scheme urgently. It was also agreed that as provided for in the scheme formulated by the Central Government, the salary scales of Principal and Professors of an Engineering College should be the same as those of Chief Engineer and Superintending Engineer respectively of the State concerned. The Gujarat Chief Minister suggested that the salary scale of the Principal may be equated to that of Director of Technical Education in the State.”

3. As regards the other measures necessary, the Conference generally endorsed the recommendations made by the Co-ordinating Committee.
4. A detailed report on the implementation of the Salary Scale Scheme is submitted to the All India Council under Item No. 16 of the agenda.

ITEM NO. 10.—To receive a note on the Administrative Staff College, Hyderabad.

The All India Council for Technical Education at its thirteenth meeting held on 30th April, 1960, recommended the continuance of financial support to the College with an annual recurring grant or subscription. The Council was not in a position to make specific recommendations regarding the amount which should be paid annually and desired that this should be decided after a scrutiny of the full details pertaining to the running of the College. The Central Government after the necessary scrutiny of the financial position of the College have since decided to continue the payment of a block recurring grant of Rs. 2·5 lakhs per annum for a further period of three years commencing from the year 1960-61.

The Council further desired that a comprehensive note on the College and its working should be placed before it at the next meeting. Accordingly a detailed note on the College is given in Annexure 'VP'.

ITEM NO. 11.—To consider the question of Expansion of Facilities in Town Planning.

1. The problem of Housing in the Five Year Plans has been considered by the Central Government in the Ministry of Works, Housing & Supply. The Ministry convened a conference of State Housing Ministers and representatives of other Ministries in June, 1955 to consider this matter in detail and to formulate measures to solve the problem of housing.

2. The Conference while considering the need for a planned development of cities, towns and rural areas noted that the number of town planners in India was extremely small and that lack of qualified personnel was one of the main difficulties in preparing and executing town and country planning schemes. The Conference further noted that for the training of town planning personnel there were only two institutions *viz.* the Kharagpur Institute and the School of Planning, Delhi which conducted full-time courses. The Conference therefore, recommended that the All India Council should examine the question of expansion of training facilities preferably on a regional basis.

3. The above recommendations of the Housing Minister's Conference were considered by the Coordinating Committee at its 23rd meeting held on 14th July, 1956. The Committee decided that the recommendations should be examined in

the first instance by the Board of Studies in Architecture and Regional Planning which may suggest additional centres, if necessary, for the development of training facilities in this field.

4. The Architecture Board considered the question of expansion of training facilities in Town & Country Planning at its meeting held on the 4th November, 1957. The Board observed that there was a need for organising a network of facilities in this field, which should, however, be done only at such centres where facilities for training in Architecture, Engineering, Economics and Sociology were available. It is also necessary that a sufficient number of Town Planners should be available at these places, who could assist the Schools in the teaching of town planning. Further, there should be an adequate number of students interested in training in town planning. The Board appointed a sub-committee under the Chairmanship of Shri S. H. Parelkar to suggest centres where facilities for training of Town Planners may be organised on the basis of these factors.

5. Proposals for starting Town Planning courses were invited from State Governments, Universities and Institutions which satisfied the criteria indicated in para 4 and was considered by the Specialist Committee in consultation with the Central Regional and Urban Planning Organisation of the Ministry of Health. A copy of the report given by the Specialist Committee is given at Annexure VII.

6. The Specialist Committee has estimated that the additional requirements of Town Planners for the Third Five Year Plan period would be of the order of 450. The training facilities available today for Town Planning are at three places, namely, School of Planning & Architecture, Delhi, Indian Institute of Technology, Kharagpur and the Bengal Engineering College, Sibpore. The Delhi School has an admission capacity of 25 candidates per year, the Kharagpur Institute 8 candidates and the Bengal Engineering College 7 candidates. The total output of town planners from these three institutions during the Third Plan period will be of the order of 150. There will be therefore a shortage of qualified Town Planners, and to meet this shortage the Specialist Committee has made the following recommendations :—

- (i) The present course in the Bengal Engineering College should be reorganised as a full-time course

with an intake of 20 to come upto standards laid down by the Institute of Town Planners (India).

- (ii) A course in Town Planning should be started in :
- (a) The J. J. College of Architecture, Bombay ; and
 - (b) The Department of Architecture, Madras University, with an intake of 20 candidates each per year.
- (iii) If the demand for Town Planners justifies it, the Delhi School of Planning and Architecture should start a part-time course.

7. The Architecture Board endorsed the above recommendations of the Specialist Committee at its meeting held on the 16th August, 1960.

8. In view of the far reaching recommendations of the Board in as much they envisaged the starting of two additional centres *viz.* at Bombay and Madras, and the development of the Bengal Engineering College, Calcutta, it was considered necessary to find out from the State Governments their requirements of Town Planners during the next five years. Accordingly all State Governments were addressed in the matter and the following information regarding their requirements for Town Planners was received. The information furnished by the State Governments indicate that there will be a shortage of trained Town Planners during the Third Five Year Plan period.

<i>States</i>	<i>No. of Town Planners required</i>
1. Bombay	40
2. Kerala	10
3. Madras	204 (Post Licentiate) 178 (Post-graduate)
4. Manipur	Nil
5. Tripura	2
6. Uttar Pradesh	15
7. Mysore	30
8. Bihar	18
9. Delhi	Nil
10. Laccadive & Minicoy Islands	Nil
11. Andhra Pradesh	6

<i>States</i>	<i>No. of Town Planners required</i>
12. Assam	9
13. Madhya Pradesh	7
14. Orissa	3
15. Gujarat	6

Information regarding the number of Town Planners required by the State Governments of Punjab, Rajasthan, Bengal and Jammu & Kashmir has not been received so far.

9. The proposals made by the Expert Committee of the Architecture Board regarding expansion of training facilities in Town Planning and starting of additional centres for the purpose are now placed before the Council for consideration.

ITEM NO. 12.—To report the establishment of two All India Institutes of Management at Calcutta and Ahmedabad.

1. Towards the end of 1959 Prof. George W. Robbins, Associate Dean, Graduate School of Business Administration, University of California and Consultant to the Ford Foundation visited India to formulate a scheme for the establishment of an Institute of Management Studies. Dean Robbins visited various institutions conducting courses in Management in this country and after taking note of the present state of development in this field submitted a scheme for the setting up of an All India Institute of Management. The salient features of the scheme are as shown below :—

- (a) The Institute should be established on an All India basis with the financial support both from Industry and Government.
- (b) *Location.*—This is to be decided after taking into consideration various factors, namely, (i) availability of varied types and sizes of business to serve as laboratory, (ii) assurance of adequate resources, and (iii) presence of an environment favourable to growth and experimentation.
- (c) *Organisation.*—The Institute should be set up as an autonomous society under the Societies Registration Act. There should be a governing body representing Government, business and education.

There should be an Executive Council to direct the affairs of the Institute in accordance with the policies laid down by the Governing Board.

(d) *Courses of Studies.*—The Institute should offer Master's and Doctor's Degree in Management. It should also conduct a special short term courses and seminars. The courses are explained below in brief :-

(i) *Master's Degree Course.*—It should be a regular 2 years full-time course and award Master's degree. It should be open to young graduates of Arts, Science or Engineering having aptitude for the training.

(ii) *Short term courses and seminars.*—Special courses and seminars should be organised for practising managers at the middle and top level.

(iii) *Research Degree or Doctorate.*—The Institute should build up resources to award Doctorate Degree for candidates demonstrating outstanding scholarship and ability to carry on research and teaching at a high level in business or in institution.

(e) *Intake.*—The intake for the Master's course should be intially 60 to be raised to 150 ultimately.

(f) *Staff*—

(i) Director (Administration)	1
(ii) Librarian	1
(iii) Business Manager for Records, Accounts	1
(iv) Research Director	1
(v) Chairman of Educational Programme	1
(vi) Incharge of Students Affairs	1
(vii) Placement Officer	1
(viii) 27 to 38 Faculty Members depending upon number of students	

(g) *Financial Implications.*—The financial estimates of the project are as shown below :—

Non-recurring :

Building (25,000 sq. ft. for Office, Class rooms etc. and 75,000 sq. ft. for hostels).	Rs. 30,00,000
Equipment	Rs. 8,00,000
Library	Rs. 3,00,000
TOTAL	Rs. 41,00,000

Ultimate Recurring :

Salaries & Wages	Rs. 11,00,000
Other expnses.	Rs. 3,00,000

(h) Sharing of cost.

State Government and local Industrialists	Cost of land and building.
Central Government :	Entire recurring expenditure.
Ford Foundation :	(1) Books for Library.
	(2) Top-ranking experts for five years.
	(3) Training facilities for Indian teachers abroad.
	(4) Foreign Exchange portion of Equipment.

2. The scheme was considered by the Planning Commission which accepted it in principle. It was further examined in the Ministry. Discussions were also held between the Minister for Scientific Research and Cultural Affairs and Dr. Ensminger of the Ford Foundation. It was felt that while facilities for Management studies should be developed in the country along correct lines, we should ensure that the existing centres for management studies were included in that programme of development. Another important point considered was that for a vast country like India, we have to think in terms of more than one Institute. Dean Robbins had himself suggested the establishment of two or three all-India Institutions to meet the requirements for management personnel. It has, therefore, been decided to establish two All India Institutes of Management one at Calcutta and another at Ahmedabad, with the assistance provided by the Ford Foundation.

Planning Committees have been set up to prepare details of the scheme of the Calcutta & Ahmedabad Institutes.

ITEM NO. 13.—To consider the question of the number of attempts that might be permitted to a candidate to pass the first year examination of Engineering/Technological Courses.

1. The Co-ordinating Committee of the All India Council for Technical Education at its 27th meeting held on the 18th October, 1958, considered the question of the number of attempts that might be permitted to an individual candidate for passing the first year examination either in degree or in

diploma courses in Engineering. The Committee recommended that unsuitable candidates should be eliminated at the end of the first year of the courses with a view to ensuring effective utilisation of available facilities and providing timely advice for such candidates to choose alternative courses and requested Universities, State Boards, and institutions to formulate suitable rules for the purpose. The Committee also recommended that no student should be allowed to continue to study in the first year class of his course beyond two years nor should he be allowed to appear at more than three examinations including supplementary examinations for the completion of the first year course.

2. The above recommendations of the Co-ordinating Committee were accepted by the University Grants Commission and were communicated to all Engineering and Technological Institutions in the country.

3. At the last meeting of the Council held on 30th April, 1960 the matter was again considered. A view was put forward that students failing in the first year examination of degree/diploma courses in Engineering/Technology should not be re-admitted to the College. Such students should be asked to take to other vocations. Some members, however, felt that it would be hard on the students if on account of one failure they were deprived of an opportunity to go through technological courses. Their failure could be due to personal difficulties or other bonafide reasons.

4. After a detailed discussion the Council decided that a statistical study of failures should be made to enable the Council to consider the question of whether one attempt or two attempts should be permitted to the students to pass the first year examination. In the meantime, technical institutions might be permitted to exceed the sanctioned intake upto a limit of 10% to enable the institutions to provide facilities to failed students.

5. All the institutions conducting degree and diploma courses in Engineering and Technology were asked to furnish statistical information relating to failures in their first year examination during the last five years. A summary of the replies received is placed at Annexure VIII.

It will be observed from the summary that a large number of candidates fail in the first year examination in the first attempt. Most of these failed candidates however, pass in the second attempt but there are a few candidates who fail even in the second or subsequent attempts. The reasons for

large failures in the first attempt have not been indicated by the institutions. One institution in U.P. has, however, expressed the view that since the time Hindi has been fixed as the medium of I.Sc. Examination, the number of failures has increased owing to the difficulty experienced by the students in following the lectures in the Engineering College where English is the medium of instruction. Another institution has attributed failures in the second or subsequent attempts to the following reasons :

- (i) Low aptitude for engineering studies.
- (ii) Serious or prolonged illness preventing the candidates from studying.
- (iii) Financial or other worries preventing candidates from concentrating on their studies.

ITEM NO. 14.—To consider the Report of the Expert Committee on Pedagogical Training of Technical Teachers of Multipurpose Schools.

1. On a request made by the All India Council for Secondary Education, the All India Council for Technical Education appointed in February, 1957 an Expert Committee to work out the contents, duration and other details of a Pedagogical course for the training of technical teachers of Multipurpose Schools which might be organised in selected technical institutions. The Committee consisted of the following:—

- (i) Shri J. A. Taraporewala—Chairman.
- (ii) Shri S. C. Sen.
- (iii) Shri S. A. Abbas.
- (iv) Principal of the Institute for the Training of Instructors, Koni—Bilaspur.
- (v) Dr. A. C. Joshi.
- (vi) Prof. T. K. N. Menon.

2. The Committee held two meetings and made recommendations regarding the contents and other details of the Pedagogical course. The Committee also prepared a syllabus for the course. The main recommendations of the Committee are as given below :—

(a) **Duration of the Course**

The Committee has recommended a period of three months comprising 12 weeks each of 30 hours *i.e.* a total of 360 hours for the entire course. 25% of this period *viz.* 90 hours have been allotted for practice teaching including

preparation of lessons. Of the remaining period, 15% of the available time *viz.* 40 hours have been allotted to the study of practical subjects (Trade practice) and the remaining 230 hours for the study of the course. Out of three months duration of the course recommended, not more than one month should be within the summer vacation of the polytechnics. This decision has been taken with a view to ensure that the trainees are in contact with the working period of the Institute and can have practice teaching during the period of two months. The Committee felt convinced that the entrance course of this type for a period of three months will fulfil its immediate objective, namely to give adequate training to the present teachers in institutions without serious difficulties to the institutions in utilising them for the academic sessions. The Committee was also of the view that when these short term courses of three months have been well established, say at the end of a two-year period from their implementation, it will then be appropriate to review and plan full nine months' training course, if necessary, so as to produce very satisfactory type of teachers in this important field.

(b) **Contents of the Course**

The broad lines of the practical subjects envisaging special methods of teaching technical subjects suggested by the Expert Committee are as follows :—

1. Aims and ideals of general education.
2. Psychology of education.
3. Student Counselling.
4. The meaning and scope of technical education and its importance in modern times in Industry, Art & Agriculture.
5. A brief history of Technical Education in India—
Targets of technical education, in Five-Year Plans.
6. Aims and objects of teaching technical subjects in Secondary Schools.
7. Problems of discipline.
8. Methods of teaching technical subjects:—
 - (a) Lecture Method
 - (b) Demonstration Method.
 - (c) Project Method, etc.

9. Essentials of the Syllabii in different technical subjects —a critical study of the existing syllabii.
10. Inter-relation of different workshop processes, *viz.*, Machine-Drawing, Carpentry, pattern-making, moulding and foundry, Smithy, fitting, machining including Lathe-work.
11. Historical aspect of older trades, such as carpentry, foundry and lathe-work.
12. Layout and equipment of shops and laboratories— Safety measures.
13. Visits to workshops—their planning, execution and evaluation.
14. Some “Dos” and “Donts” for teachers of technical subjects.

The contents of the course have been broadly divided into the following subjects :—

- (i) Principles of General and Technical Education;
- (ii) Educational Psychology;
- (iii) Methods of teaching technical subjects;
- (iv) School, Class and Shop Organisation.

In addition, the course would include supervised practice Teaching and Study of practical subjects. Practice teaching should consist of 20 lessons for each teacher-trainee.

(c) Centres of Training

The Committee considered the question of providing centres for teachers already teaching technical subjects in Multipurpose schools. The Committee also had in view the proposal of the Government of India to open four regional centres to train technical teachers for Polytechnics. The Committee felt that these training centres will not be suitable for the purpose of the training of multipurpose school teachers for a number of reasons. Each school may choose a location, where a polytechnic, a higher secondary school or a multipurpose school with technical training and teachers' training college are available. Where an engineering college is available but no polytechnic, the location will be suitable provided the higher secondary/multipurpose high school and teachers' training college are available. Only when

such a centre of this type is not available, alternative sites may be considered by the states.

The above recommendations of the Expert Committee are now placed before the Council for consideration.

A copy of the scheme of training prepared by the Committee is given at Annexure—IX.

ITEM NO. 15.—To consider the question of revising the estimates of costs of cycle sheds for technical institutions

The Co-ordinating Committee of the All India Council for Technical Education at its meeting held on the 1st November, 1960 decided that among the various Students' amenities to be provided at Technical institutions, Cycle Sheds should be constructed. The Co-ordinating Committee also approved that the rate for construction of a Cycle Shed should not exceed Rs. 20 per cycle. The capacity of a Cycle Shed in an institution should be decided by the concerned Regional Committee taking into account local conditions.

These recommendations were reported to the Western Regional Committee at its meeting held on 27th April, 1961. The Chairman of the Western Regional Committee has now expressed the view that the rate of Rs. 20 per cycle recommended by the Co-ordinating Committee has not been correctly calculated. According to institution estimate, the average cost is nearer Rs. 40 per cycle. (A copy of his letter dated 28th April, 1961 addressed to the Western Regional Officer is given at Annexure—X).

ITEM NO. 16.—To Receive a Note on the Implementation of Revised salary Scales of Teachers in Technical Institutions

The All India Council for Technical Education at its meeting held in March, 1958 recommended improved salary scales for teachers of technical institutions as an important measure to over-come the present shortage of teachers and to attract well qualified persons to the teaching profession. The scheme of revised salary scales as formulated by the Council is as given below :—

Degree and Post-Graduate Institutions

(a) Technical institutions should be divided into two categories for the purpose of pay scales—Class 'A' institutions,

where the main emphasis is on post-graduate courses and research and Class 'B' institutions which conduct degree and even a limited number of post-graduate courses. The Ministry of Education and Scientific Research in consultation with the All India Council for Technical Education and the University Grants Commission should determine the categorisation of institutions.

(b) The salary scales in these institutions should be as follows :—

Designation of post	Salary Scales for institutions	
	Class 'A'	Class 'B'
Director/Principal	2000—2500 (in exceptional cases an additional pay of Rs. 500 P.M. may be allowed).	1300—60—1600—100—1800
Professor (Senior Scale)	1600—100—1800	**
Professor (Ordinary Scale)	1000—50—1500	1000—50—1500
Asstt. Professor	600—40—1000—50/2—1150.	600—40—1000—50/2—1150.
Lecturers	350—350—380—380—30—590—E.B.—30—770—40—850 with a starting salary of Rs. 410 p.m.	350—350—380—380—30—590—E.B.—30—770—40—850 with a starting salary of Rs. 410 p.m.
Workshop Superintendent.	600—40—1000—50/2—1150.	600—40—1000—50/2—1150.

The number of posts in the senior and ordinary scales for Professors should be determined from time to time.

**Ordinarily there would be no post of senior professor in a Class B institution. However, having regard to the personal eminence of a member of the staff, a post of professor in the senior scale may be created in a class 'B' institution also. Also the number of posts in the Senior and Ordinary scales for professors should be determined from time to time.

(c) For the purpose of salary scales, all existing posts of Associate Professors should be regarded as Professors in Ordinary scale and the post of Readers regarded as Assistant Professors.

Diploma Institutions

(a) The salary scales in these institutions should be as follows :—

Designation of post	Salary Scales
Principal	800—40—1000—50—1250.
Head of the Department (Lecturer-in-Charge)	600—40—1000.
Lecturer	350—350—380—380—30—590— E.B.—30—770—40—850.
Workshop Superintendent	Ditto.
Senior Instructor	260—10—300—15—450—25/2— 500.
Junior Instructor	160—10—300.

2. The Central Government considered the recommendations of the Council and decided that the salary scales of teachers of technical institutions conducting first degree courses and diploma courses should be improved as shown below :—

(a) *Engineering colleges and other technical institutions conducting first degree courses in engineering/technology*

Principal	The salary scale should be the same as for the Chief Engineer, P.W.D. of the State Government concerned.
Professor	The salary scale should be the same as for the Superintending Engineer, P.W.D. of the State Government concerned.
Asstt. Professors and Workshop Superintendent	Rs. 600—40—1000—50/2—1150.
Lecturer	Rs. 350—350—380—380—30—590—E. B.— 30—770—40—850.

(b) *Polytechnics conducting diploma courses*

Principal	Rs. 800—40—1000—50—1250.
Head of Deptt.	Rs. 600—40—1000.
Lecturer & Workshop Superintendent	Rs. 350—350—380—380—30—590—E. B.— 30—770—40—850.
Senior Instructor	Rs. 260—10—300—15—450—25/2—500.
Junior Instructor	Rs. 160—10—300.

3. It was further decided that Junior Lecturers, Assistant Lecturers and Instructors in degree institutions be grouped together into one category to be designated as "Associate Lecturers" and given the scale of Rs. 300-25-500-30-560.

4. Any anomaly arising from the above decisions in respect of pay scales of Principals and Professors in institutions conducting first degree courses was decided to be settled in consultation with the State Government concerned. It was also decided that at engineering and technological institutions conducting post-graduate courses, the pay scales of Professors in the senior scale should be adjusted between the pay scale of Chief Engineer and Superintending Engineer in the P.W.D. of the State Government concerned. It was also envisaged that the post of Professor in the senior scale may be equated to that of additional Chief Engineer or in the case of States where no such post exists an allowance of Rs. 250 may be given in addition to the pay scale of Superintending Engineer.

5. The Central Government also decided to bear the entire additional expenditure involved in the implementation of the revised salary scales in state government institutions and non-government institutions (other than university institutions) for a period of five years in the first instance. The question of the manner in which that responsibility should gradually devolve on State Governments could be considered at the end of five years.

6. As regards University institutions, the recommendations of the All India Council together with the decisions of the Central Government were referred to the University Grants Commission. The Commission decided in September, 1960 to implement the scheme of revised salary scales as originally formulated by the All India Council for Technical Education and agreed to bear the entire additional expenditure involved for a period of five years in the first instance. The resolution of the Commission in this regard may be seen at Annexure XI.

7. Between the original scheme of All India Council for Technical Education and the decisions of the Central Government there is no difference in so far as polytechnics are concerned. As regards first degree institutions, there is no difference in so far Lecturers and Assistant Professors including Workshop Superintendents, are concerned, except that in the former case the Central Government has not

agreed to give a starting salary of Rs. 410 as recommended by the All India Council for Technical Education. At the levels of professors and heads of engineering colleges, the Central Government's decision is to equate the scales to those of Superintending Engineers and Chief Engineers of the State Public Works Department concerned respectively. As regards post-graduate institutions the decision of the Central Government is to equate the scale of senior professor to that of Additional Chief Engineer or alternatively to that of Superintending Engineer plus a special pay of Rs. 250 p.m. *The University Grants Commission has accepted the All India Council for Technical Education scheme in toto.*

8. The scheme of improved salary scales as approved by the Central Government was communicated to all State Governments in April, 1959 with a request that the State Governments may implement it in their own institutions and also in non-government institutions in their respective areas. After persuasive efforts made with the State Governments, Andhra Pradesh, Madhya Pradesh, Assam and Rajasthan have finally accepted the scheme and proceeded to implement it. The remaining State Governments have yet to implement the scheme. At the Conference of Chief Ministers held on 15th January, 1961, however, the Chief Ministers of Punjab, Bihar and Orissa informed that their States also had accepted the scheme. Formal communications from these State Governments are awaited. The Conference of Chief Ministers decided that in the larger interests of technical education in the country, the scheme should be accepted by all States and implemented for forthwith.

9. Although University Grants Commission has accepted the All India Council for Technical Education scheme *in toto*, the Commission has excluded teachers of Pharmacy, Radio Physics, Electronics, Applied Chemistry, Applied Physics from the scheme of revised salary scales. According to the All India Council for Technical Education, however, all these subjects are treated as technological and grants are being given to Universities for the development of these subjects according to correct standards. It is therefore not clear why the University Grants Commission has decided not to extend the revised salary scales to teachers of these subjects. In fact, All India Council for Technical Education has recommended that the teachers of Physics, Chemistry & Mathematics in technical institutions should be given the same scales as the teachers of engineering and technological subjects. In

view of these considerations, the Ministry has requested the Commission to reconsider its decision regarding Applied Physics, Applied Chemistry, Electronics etc.

10. As stated earlier, the Government of Uttar Pradesh, Punjab, Jammu & Kashmir, West Bengal, Orissa, Bihar, Madras, Kerala, Mysore, Gujarat and Maharashtra have yet to implement the scheme of revised salary scales. The Governments of Madras and Kerala have, however, stated that the scales of pay of teachers of technical institutions in their States have been revised as shown below :

Kerala

Post	Old Scale	Revised Scale introduced by State Government	Scales of pay recommended by the Central Government
1	2	3	4
<i>Engineering Colleges</i>			
Principal . . .	800—1000 .	1000—1200 .	900—1200 Chief Engineer, State P.W.D.
Professor . . .	700—900 .	800—1000 .	700—900 Superintending Engineer, State P.W.D.
Asstt. Professor . . .	450—600 .	475—700 .	600—1150.
Workshop Instructors } 1st Grade Instructors.	150—350 .	250—500 .	300—560 (Associate Lecturer).
Lecturer . . .	250—500 .	300—550 .	350—850.
<i>Polytechnics</i>			
Principal . . .	500—700 .	500—800 plus 100 Spl. pay.	800—1250.
Head of Deptts. . .	250—500 .	300—550 .	600—1000.
Lecturer . . .	250—500 .	300—550 .	350—850.
Instructor 1st Grade Instructor.	250—500 .	300—550 .	260—500 (Senior Instructor) 160—300 (Junior Instructor).

11. The State Government has intimated that while considering the need for giving better scales of pay to technical teachers, the impact of such an increase to the salary of a particular category of officers in other cadres of State Services cannot be ignored. The State Government has expressed the view that the fixation of pay scales of such staff can be done only in the larger back-ground of the pay structure of the State services in general. In view of this position the State Government has expressed its inability to further revise the salary scales of teachers in technical institutions as suggested by the Central Government.

12. It may be observed from the above table that if the principle of equivalence is strictly adopted, the Principal of an Engineering College in the State should get Rs. 900-1,200 *i.e.* the same as for the State Chief Engineer; the Professor should get Rs. 700-900, the same as for the State Superintending Engineer. The State Government has, however, proposed a scale of Rs. 1,000-1,200 for the Principal and Rs. 800-1,000 for the Professor. Corresponding revisions have been made in other categories of staff to fit into their own scheme. If the principle of equivalence is strictly enforced, the Assistant Professor's scale *viz.* Rs. 600-1,150 will be better than that of the Superintending Engineer's scale *viz.* Rs. 700-900 the scale which will be admissible to the Professor. This represents an anomalous situation.

13. In view of the complexity of the situation, the Ministry has suggested to the State Government that the scale of Professor may be equated to that of Chief Engineer and the Principal may be in the Chief Engineer's scale plus a special pay of Rs. 250. For staff below Professor, the Ministry has suggested the adoption of the scales included in Central Government Scheme in order to ensure uniformity in all institutions in the country.

14. As regards polytechnics, the scales proposed by the State Government are far below those recommended by the Central Government. Since here no question of equivalence is involved, the State Government has been requested to adopt the scales as recommended by the Central Government in the larger interests of technical education in the country and to over-come the shortage of staff existing in the polytechnics in the State.

Madras

15. The Government of Madras have informed that the State Pay Commission has made its recommendations regarding the revision of pay scales of Government servants in

the State in all categories. The Commission while making recommendations had before it the revised salary scales recommended by the Central Government for teachers of technical institutions. The following table indicates how the scales of pay accepted by the State Government compare with those suggested by the Central Government for teachers of technical institutions:—

	Existing Scale.	Scale of pay accepted by the State Govt. on the recommendations of State Pay Commission.	Scales of pay recommended by Central Government.
<i>Engineering Colleges</i>			
Principal	1000—75/2—1225	1100—50—1300— <i>plus</i> Spl. pay (1) Rs. 200 for P. G. Instts. (2) Rs. 100 for degree Instts.	Rs. 1500—50—1800 Chief Engg. State. P.W.D.
Professor	600—75/2—900	1100—50—1300— for P. G. courses. 600—1100 for Associate Prof- essors.	1100—1300 Sup- erintending Engg. State P.W.D.
Asstt. Prof. & Workshop Supdt.	..	No such category exists.	Rs. 600—1150.
Lecturers	260—700	350—25—850	350—350—380— 380—30—590— E. B.—30—770— 40—850.
<i>Polytechnics</i>			
Principal	400—700	600—1000	800—1250.
Heads of Deptts.	230—410	350—650	600—1000.
Lecturer	180—240	275—425	350—850
Workshop Supdt.	260—500	350—650	350—850
Senior In- structor.	120—180 (Asstt. Lecturer).	225—15—375	260—500
Junior In- structor.	100—150	175—275	160—300.

16. The scales accepted by Madras Government on the recommendations of the State Pay Commission while definitely better than the existing ones do not compare with those recommended by the Central Government. The State Pay Commission has, however, taken the following two factors as its guiding principles in formulating its recommendations:—

- (a) It is the pay in the initial stages in grades to which direct recruitment is generally made, which is of significance in determining the quality of recruits and not so much the scales of pay in higher grades which are largely filled by promotion;
- (b) The enhanced scales of pay proposed for teaching posts had necessarily to be related to the scales of pay proposed for different grades of engineers in the State P.W.D. for which (latter category) there is no offer of financial assistance from the Central Government.

These two factors have led the Pay Commission to recommend a larger order of increase in emoluments for employees in the lower grade than for those in the higher grade and also relating the increases to existing scale of pay obtaining at comparable levels in the State P.W.D.

ITEM No. 17.—To consider the scheme for the establishment of a Central School of Printing

1. On the recommendations of the All India Council for Technical Education, four Regional Schools of Printing have been established at Allahabad, Bombay, Calcutta and Madras. The first School was established in 1955-56 at Madras and the last in 1957-58 at Allahabad. The Schools offer a three-year diploma course in Printing Technology (either in Letterpress or in Lithography Group). The admission qualification to the course is Matriculation or Higher Secondary. Each School has been designed to cater for a student body of 200. The course is intended to prepare candidates for junior supervisory positions in printing industry.

2. The All India Council for Technical Education had also agreed in principle to the establishment of a Central School of Printing for advanced training and research in the subject after facilities for training at lower levels had been well established. Since the Regional Schools have made

fair progress and facilities for training at the National Certificate level have been developed, the Central Government considered that a stage had been reached at which the question of establishment of the Central School might be considered under the Third Five-Year Plan. In order to formulate a detailed scheme for the School, a special officer was appointed. The scheme prepared by the Planning Officer was considered in detail by the All India Board of Technical Studies in Applied Art which also consulted the All India Federation of Master Printers and leading printers in the country. A copy of the scheme as approved by the Board is placed at Annexure XII.

3. The salient features of the scheme are as given below:

- (i) The School should be named the Indian Institute of Printing.
- (ii) The object of the School is to train students at the highest level possible in Printing Technology, including training in printing management. The products of the school, after the requisite experience, will occupy senior supervisory positions in Industry. The students will undergo intensive training in different branches of Printing Technology, Cost Control, Production Control, Management etc. leading to the award of National Diploma in Printing which corresponds to a University degree in the field.
- (iii) The admission qualifications to the course will be:
 - (1) University degree preferably in Physics, Chemistry and Mathematics.
 - or
 - (2) Holders of National Certificate in Printing with two years' experience in Industry.
- (iv) *Intake*.—The annual intake will be 100.
- (v) *Duration*.—The School will offer a regular full time course in Printing Technology of the first degree standard. The duration of the Course will be 3 years for graduate-entrants and 2 years for National Certificate holders. 80% seats should be reserved for graduates and of the remaining 20%, half the seats should be reserved for National Certificate holders who are sponsored by Industry and the other half for the National Certificate holders who though not sponsored by Industry have a good academic record.

- (vi) In addition to the full time course, the School should conduct short term specialised courses in different branches of Printing for persons who are already in the trade.
- (vii) There should be a Research Unit where research on problems encountered by industry and referred to the Unit could be carried out.
- (viii) There should also be an Information Unit which should collect information on the latest developments in Industry in other parts of the world and disseminate it as well as the results of the research carried out at the Research Unit to Printing Industry.
- (ix) The estimates of cost are as shown below:—

Non-recurring

Rupees in lakhs

1. Land	14.50
2. Buildings—	
(a) Institute 1,55,000 sq.ft. plinth (30,000 sq.ft. framed structure and 1,25,000 sq.ft. factory structure) including accommodation for photogravure, Research and specialised courses and electric and water connections and air-conditioning wherever required.	25.20
(b) Hostel for 180 students—	
(i) Single seated rooms 200 6,000 sq.ft. sq.ft. per student for 30 students.	} 6.30
(ii) Three seated rooms 180 27,000 sq.ft. sq.ft. per student for 150 students.	
(iii) Hostel furniture and equipments	1.0
(iv) Dispensary with 4 beds	0.25
(v) Miscellaneous-electric connection etc.	0.25
	<hr/>
TOTAL (HOSTEL)	7.80
say	8.00
(c) Staff Quarters	19.00

3. (i) Equipments (including equipment for Research)	64.80	} 74.80
(ii) Additional Equipments for specialised courses if and when introduced.	10.00	
TOTAL (NON-RECURRING)	.	141.50
<i>Say</i>	.	142.00

Recurring

	Rs. in lakhs
1. Salary of Staff	6.70
2. Consumables (Chemicals, Paper, Binding material etc. etc.)	1.50
3. Power & Water	0.07
4. Scholarships (for 25% students) . . . . .	.86
TOTAL (RECURRING)	9.13 lakhs
<i>Say</i>	9.20 lakhs

Staff

4. The requirements for staff have been worked out on the basis of an annual intake of 100 students and an optimum teacher-student ratio of 1:12. In the initial stages of the working of the Institute, the services of foreign experts with suitable qualifications should be secured under foreign aid programmes. The experts will be required in Composition, Design, Graphic Reproduction, Letterpress and Foundry, Lithographic Printing and Printers' Engineering. Experts in Photogravure and other specialised subjects may be obtained in the second phase. In addition to these experts, two more experts would be required—one for planning and organising the courses in the Institute and the other to plan and organise Research and Information Services. All the experts should work under an Indian Director. Initially, Indian teachers would work against junior posts at the Institute such as lecturers and demonstrators etc. These teachers would gradually take over senior appointments from their foreign colleagues.

Location

5. The Board expressed the view that the Institute should be located at a centre where printing, packaging and allied industries are well developed. The Board noted that only Bombay or Calcutta satisfied these conditions and

desired that the Ministry should take the final decision in the matter keeping in view the availability of land and other related aspects.

ITEM No. 18.—To consider the present position regarding admission of students to Polytechnics

1. Reports were received in the Ministry from Regional Offices regarding the poor calibre of students admitted to certain polytechnics and the non-utilisation of facilities available in other institutions. In order to have a comprehensive picture of the present state of admissions to polytechnics, the calibre of students admitted, the extent of utilisation of the facilities available etc., the Regional Offices were asked to carry out a survey of all institutions in their respective areas and analyse the data collected and submit reports for the consideration of the All India Council.

2. The Regional Officers accordingly carried out a survey in respect of admissions made in 1960-61. The results are summarised in the table given overleaf :—

A. State-wise Analysis of Admissions made to Diploma Institutions in the Country during the academic year 1960-61

Sl. No.	State/Union Territory	Total No. of Instts. under Consideration	Total No. of sanctioned seats	Minimum Admission qualifications prescribed together with qualifying marks	No. of eligible applications	No. of candidates admitted who had secured								Total of candidates admitted	No. of seats remaining unutilised	Excess admission made			
						1st class or 60% marks and above		between 50% and 60% marks		between 45% and 50% marks		below 45% marks				in Instts. numbering	No. of seats unutilised	in instts. numbering	Excess
						No.	% of the total	No.	% of the total	No.	% of the total	No.	% of the total						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	U. P.	22	2,490	High School with 45% marks in Maths. & Science.	6,361	252	11.6	996	45.8	488	22.4	445	20.2	2177	13	365	6	52	
2	Punjab	11	1,430	Matric with 50% marks.	3,756	822	58.0	565	39.9	25	1.8	4	0.3	1,416	4	14	nil	nil	
3	Rajasthan	5	760	Entrance Exam. conducted by State Board 25% qualifying marks.	1,096	26	4.8	94	17.2	103	18.9	323	59.2	546	4	214	nil	nil	
4	Jammu & Kashmir	1	120	Matric with Science	889	3	2.2	24	17.5	34	24.8	76	55.5	137	nil	nil	1	17	
5	U. P.	1	120	Entrance Test plus interview.	195	11	20.0	23	41.8	18	32.7	3	5.5	55	1	63	nil	nil	
6	Maharashtra	15	1,910	SSC/SSLC or equivalent with English, Maths., Science.	4,240	811	42.3	645	33.6	314	16.4	149	7.8	1,919	5	279	5	48	
7	Madhya Pradesh	12	1,130	SSC or Matric with 40-45% marks in Science.	1,417	162	17.1	363	38.4	331	35.0	90	9.5	946	6	147	2	13	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
8	Gujarat . .	11	1,385	SSC or equivalent with English, Maths., Science.	6,687	315	21.6	828	56.8	239	16.4	76	5.2	1,458	3	179	4	72
9	Mysore . .	24	2,960	SSLC with Science and Maths.	11,834	1,196	39.6	994	32.9	381	12.6	44 ⁸	14.8	3,019	3	34	1	13
10	Madras . .	23	2,084	SSLC with 35% in compulsory Maths. and/or Science.	6,082	412	13.3	1273	41.0	908	29.2	513	16.5	3,106	7	91	nil	nil
11	Kerala . .	9	1,130	Passed SSLC and eligible for College/University course.	1,243	220	19.5	454	40.3	288	25.0	165	14.6	1,127	nil	nil	nil	nil
12	Andhra Pradesh	17	2,235	HSC, SSLC or equivalent.	10,017	471	21.6	900	41.2	543	24.9	263	12.3	2,182	6	81	nil	nil
13	West Bengal .	12	2,020	School Final or equivalent	11,890	85	4.7	569	31.2	590	32.4	578	31.7	1822	8	250	4	52
14	Bihar . .	7	879	Matric with Physics, Chemistry and Maths.	7,869	425	48.0	337	38.0	102	11.5	22	2.5	88.6	2	4	1	11
15	Orissa . .	5	610	Matric or equivalent with Science.	1,430	5	1.2	72	17.3	82	19.7	25 ⁸	61.9	417	4	193	nil	nil
16	Assam . .	3	420	Matric or SSLC . .	795	4	0.9	36	8.5	101	23.9	282	66.7	423	1	3	1	18
17	Manipur . .	1	60	Matric or SSLC . .	78	..	..	..	..	..	..	36	100.0	36	1	24	nil	nil
18	Tripura . .	1	90	S. F. or H.S. . .	194	..	..	..	..	29	37.0	4 ⁹	63.0	78	1	12	nil	nil

3. The overall position in each State is as given below:—

WESTERN REGION

Madhya Pradesh

4. The ratio of applications from eligible students to the total number of seats available is 2:1. Six polytechnics could not maintain even this ratio and applicants to other polytechnics have had to be diverted to these institutions. Even so, 64 seats were left unutilised. A minimum of 45% marks in the Qualifying Examination was prescribed for admission but on account of poor response, this condition has had to be relaxed. About 16% of the students admitted obtained 60% and above marks and 45% of the students less than 50% marks. The reasons given are: (a) unsatisfactory location of these polytechnics; (b) the minimum admission qualification to both engineering colleges and polytechnics being the same *viz.*, Higher Secondary and out-turn of Higher Secondaries being not large enough, the engineering colleges attract the better types of candidates.

Maharashtra

5. The ratio of the total number of applications to the total number of seats available has come down from 4.6 in 1959-60 to 3.94 in 1960-61. Excepting one institution where 30% of the seats were not utilised, all the available seats have been properly utilised. 92.23% of the students admitted to the polytechnics obtained more than 45% marks at the qualifying examination. Those admitted with less than 45% marks formed a higher percentage *viz.*, 7.77% of the total admissions this year than last year when the figure was 5.6%. Although the number of seats in the State as a whole increased by 240, the total number of applications received this year is less than that in the last year.

Gujarat

6. The ratio of the number of applications to seats available is 4.82. Although the number of seats available in 1960-61 is more than in 1959-60 there is a drop in the total number of applications, excepting at two places *viz.*, Ahmedabad and Surat. 94.7% of the total admissions consist of candidates who have secured more than 45% marks at the qualifying examination. More than half of the rest obtaining less than 45% marks have been admitted to the Baroda Polytechnic.

On the whole the response to diploma courses appears to be satisfactory.

NORTHERN REGION

Uttar Pradesh

7. Although the sanctioned number of seats is 2,490, in some of the recently started polytechnics, admissions have not been made to the full sanctioned capacity. As a result the number of available seats has been reduced to 2,310. The utilisation of the available seats comes to 94.24% if the repeaters admitted are also counted in and 85.76% if only fresh entrants are considered. 11.58% of the students have secured over 60% marks at the qualifying examination. About 20% of the admissions consist of candidates with less than 45% marks. In 1960-61, admissions have been made on the basis of an entrance examination conducted by the State Board but for electrical and mechanical engineering courses only. From 1961-62 onwards this test will not be conducted and admissions will be made on the basis of the performance of the candidates at the qualifying examination. A high percentage of admissions includes candidates possessing less than 45% marks. This is apparently due to the fact that the standard of the entrance examination is higher than the qualifying examination. The institutions where the seats could not be utilised in full are those which have not been approved by All India Council for Technical Education or those whose location is unsatisfactory.

Punjab

8. Excepting one institution which is an unapproved one, all institutions have been able to fill their seats to the extent of 99%. 58% of the total admissions consist of candidates with 55% marks in the qualifying examination and about 40% candidates with 50-60% marks.

There is a keen demand for diploma courses in the state.

Rajasthan

9. Only one of the four polytechnics in the State could utilise all the available places. The Polytechnic at Udaipur could admit only 58 students including 17 repeaters against 160 available seats. The overall utilisation is 71.84% including repeaters and 69.60% with fresh entrants. Only 4.76% of those admitted have obtained over 60% marks in the qualifying examination. 59.16% of the students admitted have

less than 45% marks. Admissions have been made on the basis of an entrance test in which a minimum of 25% of marks should be obtained for open seats and 20% for seats reserved for Scheduled Castes and Scheduled Tribes candidates. The State Board has decided to discontinue the admission test from next year and admit students directly on the basis of the results of Matriculation and Higher Secondary Examination. Entrance examination will, however, be held for those who have passed the 10th Class of the Higher Secondary Course.

Himachal Pradesh

10. Only 55 students joined against 60 seats available. The sanctioned intake in the ploytechnic of the State is 120.

Jammu and Kashmir

11. All the seats have been utilised.

12. The total number of seats sanctioned in the region as a whole is 5,040 against which only 4,680 have been made available for admission. Of the available seats only 92.5% have been utilised if the repeaters admitted are counted in. If only fresh entrants are taken into consideration the utilisation is 88%. The admissions to civil engineering courses have dropped and candidates are hesitant to seek admission to unapproved institutions. The demand for diploma courses in Rajasthan is comparatively less than in other States. Institutions located in certain places not best suited are not able to attract an adequate number of students. The suggestions of improvement made are unapproved institutions should not be affiliated to State Boards, location of new institutions should be decided in consultation with the Regional Committee and no entrance examination should be held.

SOUTHERN REGION

Madras State

13. Although all institutions have been able to utilise the seats in full, 43% of the admitted candidates have less than 50% marks in the qualifying examination and only 18% have over 60% marks. The proportion of application to available places is 2:1.

Mysore

14. The proportion of the number of applications to the number of places available is 4:1. About 37% of the candidates admitted have obtained less than 40% marks at the qualifying examination and 28% more than 60% marks.

Kerala

15. The proportion of the number of applications to the number of places available is 2:1. 40% of the candidates admitted have obtained less than 50% marks at the qualifying examination and 20% over 60% marks. In private polytechnics, the percentage of candidates with less than 50% marks have gone up as high as 72%.

Andhra Pradesh

16. The demand for diploma courses has been very good. The proportion of the number of applications to the number of places available is 5:1. 36% of the candidates admitted have obtained less than 50% marks and 22% over 60% marks.

17. In the region as a whole, the demand for diploma courses is high and particularly so in Andhra Pradesh and Mysore on the basis of the proportion of the number of applications to the number of seats available. In spite of this, the number of candidates admitted who have secured less than 50% marks exceeds one-third of the total in every institution.

EASTERN REGION

18. The Eastern Regional Office has not given an analysis of the position in each state in the Region, since it has not been able to analyse the data furnished by the institutions. Nevertheless, on the basis of the data given in the tabular statement, the position is generally as shown below :—

West Bengal

19. The proportion of number of applications to number of seats is 5.5 to 1 but only 4.7% of students admitted obtained 1st division and 63.7% of the students admitted obtained less than 50% marks at the qualifying examination. Four institutions could not use 52 seats.

Orissa

20. The proportion of total applications to total seats is 2·4 to 1. Only 1% of those admitted had 1st division marks and 37% of those admitted obtained less than 50% marks of the qualifying examination. All seats have been utilised.

Bihar

21. The proportion of total applications to total admissions is 9 to 1. Of those admitted 48% obtained over 60% marks and 14% obtained less than 50% marks at the qualifying examination in the subjects of mathematics and science. Only 11 seats were left unutilised.

Assam

22. The proportion of total applications to total admissions is 1·9 to 1. Hardly 1% of those admitted obtained over 60% marks and 90·6% of those admitted obtained less than 50% marks at the qualifying examination. All seats have been utilised.

Manipur and Tripura

23. The proportion of total applications to total admissions is 1·7 to 1. Practically all the students admitted obtained less than 50% marks at the qualifying examination. There were no unutilised seats.

ITEM NO. 19.—**To consider the proposals received from State Governments and Ministries of the Central Government regarding various aspects of Technical Education**

A. PROPOSALS RECEIVED FROM THE GOVERNMENT OF KERALA

- (a) *Affiliation of Junior Technical Schools to the National Council for Vocational Training and issue of National Certificates of Craftsmanship.*

NOTE RECEIVED FROM THE GOVERNMENT OF KERALA

1. "There are at present 9 Junior Technical Schools—one in each of the Revenue Districts in the State ; and one more school in each of the districts will be opened under a phased programme during the Third Five Year Plan period.

These schools are following closely the curricula and syllabuses indicated in the Government of India's publication on Junior Technical Schools. 9 of the schools have just completed one year.

2. Although students who come out of these schools will not be fully competent as artisans, it is expected that the majority of them will go to industry after a short period of apprenticeship. Every student will specialise in some trade or the other, while possessing a background knowledge of all basic trades. Since these schools are still in an experimental stage, Industry will not yet be familiar with the standards of attainment of students coming out of these schools and would therefore be hesitant to employ them. In order to ensure that students attain the necessary proficiency and are acceptable by Industry, it is suggested that all those who desire to join Industry may be permitted to appear for the Trade Tests conducted by the National Council for Vocational Education, after serving a period of apprenticeship of 6 months. It is hoped that if this provision is given, the Junior Technical schools will not only become popular but will also raise the standard of instruction in Workshop Practice so that the products will be acceptable by Industry and will be preferred by industrialists since the Trainee would have also had a good background of knowledge in Science and Social Studies, including Languages. If the suggestion is approved, the State Councils of Vocational Training will arrange for the necessary inspection of the Junior Technical Schools with a view to examining their fitness for affiliation to the National Council of Vocational Training."

NOTE FROM THE SECRETARIAT OF THE COUNCIL

3. The Scheme for the establishment of Junior Technical Scheme provides that at the end of the course, there should be a passing out examination held by the State Boards of Technical Education and successful candidates should be awarded certificates both for general education and for technical attainments. The certificate of technical attainment should state the particular line of specialisation of the candidate and the degree of competency attained by him in it. Wherever a boy has completed industrial apprenticeship during the course, that fact must also be stated in the Certificate. While there should be no particular objection to the suggestion of the State Government for the affiliation of these Schools to the National Council for Vocational Trades,

a better arrangement would be for the State Boards of Technical Education to conduct the examinations and award certificates. The examinations in the Trades may be in accordance with the standards prescribed by the National Council for Vocational Trades and the certificates issued by the State Boards should be endorsed by the National Council.

(b) *Grant of loan for hostel furniture*

NOTE RECEIVED FROM THE GOVERNMENT OF
KERALA

1. "Liberal grants are at present being given as a loan for purposes of construction of students' hostels laying down certain standards of accommodation. No provision for furniture and cooking utensils has been made. On an average it costs about Rs. 300 per head in hostels of Degree Institutions and Rs. 250 in Diploma Institutions. After the hostels are constructed, the authorities find it very difficult to furnish the rooms, kitchens and the dining halls etc. It is, therefore, proposed that while sanctioning loans for the construction of students' hostels suitable amounts for furniture, utensils and other equipment on a *pro-rata* basis may also be sanctioned at the same time."

NOTE FROM THE SECRETARIAT OF THE COUNCIL

2. The amounts of loans for the construction of hostels are determined on the basis of the standards of accommodation etc. prescribed on an all-India basis, the rate of building construction in each place and similar factors. As regards hostel furniture, the standard prescribed by the C.P.W.D. in 1957 is Rs. 100 per student that covers the cost of one newer bed, a writing table and a chair. The furniture for the common room and dining hall and utensils are excluded.

3. A reference has been made by the Ministry to the C.P.W.D. for the revision of the present standard of Rs. 100 per student, in view of the current rise in prices of furniture. The reply of the C.P.W.D. is awaited.

(c) *Training scheme for teachers in Polytechnics and Junior Technical Schools to be organised by respective states*

NOTE RECEIVED FROM THE GOVERNMENT OF
KERALA

1. The Government of India have instituted a scheme for training teachers in Engineering subjects, at certain selected

centres for a period of 3 years. The trainees are mainly intended to take up teaching careers in colleges and institutions of higher learning. Although there are a large number of polytechnics and some Junior Technical Schools, no satisfactory provision for giving training to teachers in such Institutions has been made. Most of these institutions are being managed by teachers who are non-degree holders and where there are degree-holders, they are only second-rate persons. It is well known that teaching staff of good calibre are generally unwilling to accept service in polytechnics. This makes it imperative to train the teachers of Polytechnics and Junior Technical Schools. The Junior Technical Schools have subjects in Sciences, Humanities and Languages in addition, and trained teachers in some of these subjects are essential. There is a provision in the Third Five-Year Plan of the State for part-time courses, short-term courses, teachers' training etc. and it is suggested that a scheme for Teachers' Training in Polytechnics and Junior Technical Schools may be recommended for inclusion in the State plans, under the head mentioned above. It is proposed to give training for a period of 3-6 months through experienced Professors of Engineering, Science and Humanities. It is also proposed to associate a few trained teachers of training colleges.

NOTE FROM THE SECRETARIAT OF THE COUNCIL

2. The Chairman of the All India Council for Technical Education has appointed a Working Group under the Chairmanship of Mr. C.V.D. Murthy, Director of Technical Education, Andhra Pradesh to formulate a scheme for the training of teachers for polytechnics. The Working Group consists of two principals of polytechnics from each region and the Regional Officers of the Ministry.

The Scheme when formulated by the Working Group will be placed before the All India Council for Technical Education.

(d) Review of facilities in Textile Technology at Diploma level

NOTE RECEIVED FROM THE GOVERNMENT OF KERALA

1. "There was only one institution in Kerala State offering facilities for training students in Textile Technology at Diploma level with an intake capacity of 24 students and this institution has been in existence for nearly a quarter of century. After the formation of the Kerala State which

included large undeveloped areas of Malabar, the need for another institution at Cannanore was felt. A proposal was therefore made for permission to open a Textile Technology Section when a new polytechnic was started in Cannanore. This permission was refused on the score that the total spindleage in Kerala did not justify a second institution and that pending report of the Fact Finding Committee on Textile Technology education in the country as a whole, the equipment available at the Trivandrum Institute may be transferred to Cannanore. This was not possible for several reasons and it has therefore become necessary to open both the institutions. No assistance is being given for the second institution. The spindleage in Kerala State has considerably increased within the last few months and is expected to increase still further. Whatever the spindleage may be, Kerala being a State whose length is unduly large compared to its total area, has special problems and it is, therefore, essential to run both the Institutions, one of which is in the extreme north and the other in the extreme south. It is therefore requested that sanction may be accorded for the second Institution, pending the report of the Fact Finding Committee. The necessary assessment may be arranged to be made and assistance offered for the purchase of the necessary equipment and the appointment of additional staff etc."

NOTE FROM THE SECRETARIAT OF THE COUNCIL

2. The Government Polytechnic, Cannanore, started functioning in July, 1958, with an annual admission capacity of 120 students for diploma courses in Civil, Mechanical and Electrical Engineering. The establishment of the Polytechnic was approved by the Chairman of the All India Council for Technical Education on 18th September, 1958. The development of the Institute of Textile Technology, Trivandrum was, however, approved for development in 1954 with an annual admission capacity of 24 students and the Central Government sanctioned appropriate grants for the purpose.

3. In 1958, the State Government on the recommendations of the State Board of Technical Education decided to shift the Textile Diploma Course conducted at the Institute of Textile Technology, Trivandrum, to the Government Polytechnic, Cannanore. The State Government's Second Five Year Plan included a provision of Rs. 15 lakhs for expenditure on the Cannanore Polytechnic for the Plan period and a provision of Rs. 8 lakhs was also made in the Third Plan for the completion of the Institute and for the transfer

of a Textile Technology Diploma Course from Trivandrum to this Polytechnic.

4. After taking a decision to transfer the Diploma Course in Textile Technology from Trivandrum to Cannanore and after admitting 24 students to the first year of the Diploma Course at Cannanore, the State Government asked the Central Government to approve the transfer of the Textile Technology Diploma Course from Trivandrum to Cannanore. This Ministry referred the matter to the Southern Regional Committee for recommendations and also asked the Regional Committee to assess the expenditure involved in the transfer as also arrangements made for utilising the buildings at Trivandrum that fell vacant. The Southern Regional Committee at its meeting held in January, 1960, recommended that since the development of the Institute of Textile Technology, Trivandrum had been approved and grants had been given for the purpose, the transfer of the Diploma Course to Cannanore was entirely the responsibility of the State Government which should also bear all the additional expenditure involved over and above the Central Government grants. The Regional Committee did not recommend any additional grants for the transfer of the course.

5. The note now received from the State Government does not explain the reasons for the non-transfer of the course from Trivandrum to Cannanore. It also indicates that in addition to starting the Textile Course at Cannanore, the State Government are continuing the same course at Trivandrum. Not only is this contrary to the original decision of the State Government but also to the recommendations of the Southern Regional Committee.

(e) *Difficulties experienced by engineering colleges and polytechnics due to non-issue of Import Licences for laboratory equipment, particularly, electrical and mechanical.*

NOTE RECEIVED FROM THE GOVERNMENT OF KERALA

1. "The Engineering Colleges of Trichur and Quilon will be opening the Final Year Classes during the ensuing academic year. Although both these institutions have applied for import licences, very little progress has been made in regard to electrical and mechanical laboratory equipment mainly due to the non-issue of the import licences. The Principal of the Engineering College, Trichur has reported that 58 Import Licences applied for by him are still pending

with the Government of India. The Engineering College, Quilon has been threatened with disaffiliation in regard to the Final Year Classes in Mechanical and Electrical Engineering by the Kerala University. The position of many of the polytechnics in the State is more or less similar. Whenever import licences are applied for, after passing through the complicated procedure of the Stores Purchase Department of Government and administrative sanctions by the Secretariat, import licences are either not issued or delayed so much that the period of validity of the tenders expires with the result that the whole process has to be repeated with no useful result. This is the main reason for the under-development of most of our Institutions in the matter of laboratory equipment. In the case of Polytechnics, we have had to give exemption from laboratory training, which is academically very unsound. In many cases, the Principals are informed to contact either the Central Agency or the State Trading Corporation. These have been of very little assistance and there has not been a single instance where they have been of any use in supplying any of our equipments. If lack of foreign exchange is the main difficulty in the issue of Import licences, permission to start new institutions should be refused, taking an overall picture of the country as a whole and not treating the States individually in this matter. The foreign exchange is a matter which affects the country as a whole and if institutions in a particular State which have been started with the approval of the Central Government cannot be given import licences to equip their laboratories, permission to start other institutions elsewhere in the country should not be given till the needs of institutions already approved are satisfied."

NOTE FROM THE SECRETARIAT OF THE COUNCIL

2. The position regarding foreign exchange has all along been a difficult one. It has become even more difficult in recent months. The Ministry of Finance has been allotting foreign exchange for technical institutions on the basis of the requirements of the institutions from time to time. The allotment, however, has been far less than the requirements. For instance, for the half year October, 1959 to March, 1960, the allotment made was Rs. 60 lakhs against the requirements of Rs. 100 lakhs ; for the half year April to September, 1960 the allotment was Rs. 60 lakhs against the requirements of Rs. 90 lakhs. In the last half year *viz.* October, 1960 to March, 1961, the allotment has been even

less. As against the requirement of Rs. 85 lakhs, the allotment was only Rs. 48 lakhs (56%). As a result, the Ministry has had to limit the foreign exchange allotment to individual institutions on the basis of the overall quota received. The foreign exchange allotment made to Kerala State institutions in relation to the quota received for the country as a whole during the last three half-yearly periods is as given below :

Period	Requirements and quota allotted for the country as a whole			Requirements and quota allotted for Kerala.		
	Requi- rements	Allot- ment	Percen- tage	Require- ments	Allot- ment	Percen- tage
	Rs. (in lakhs)	Rs. (in lakhs)				
Oct. 59 to March 60.	100	90	60%	6,40,135	4,48,962	70%
April to Sept. 60.	90	60	66⅔%	4,44,201	3,85,282	87½%
Oct. 60 to March 61.	85	48	56%	1,80,804	1,05,794	58½%

It will be observed that so far as Kerala State is concerned, the proportion of the allotment to the requirement is higher than the proportion of allotment to the requirement for the country as a whole.

B. PROPOSALS RECEIVED FROM THE GOVERNMENT OF MADHYA PRADESH

(a) *To consider the equivalence of the present three year degree courses and the four year degree courses in Engineering*

NOTE RECEIVED FROM THE GOVERNMENT OF MADHYA PRADESH

1. "There are many Universities in this country which are still following the three year course for award of Engineering degree. Candidates who follow a four year course in other institutions have to follow a superior syllabus and spend one more year in completing the same. The equivalence of degrees of these two courses gives rise to a certain sense of discrimination in the minds of students and their parents. In fact there is a feeling in some engineering quarters that the present four year course also does not give enough of

the basic concepts to the students. It is recognised that Universities are autonomous bodies but proper advice from the Council in this matter will go a long way in making the Universities reconsider their schemes of courses.”

NOTE FROM THE SECRETARIAT OF THE COUNCIL

2. The All India Council for Technical Education and the University Grants Commission have decided that as a sequel to the reorganisation of Secondary Education in the country the first degree courses in Engineering should be reorganised into Five-Year Integrated Courses with Higher Secondary as the admission qualification. The Five Year Integrated Courses as recommended by the All India Council for Technical Education have been introduced or are in the process of being introduced in a majority of technical institutions in the country. When all Universities and institutions have accepted the Five Year Integrated Courses, the question of equivalence would not present any problem.

3. Prior to the introduction of Five-Year Integrated courses the general pattern was Four-Year Degree courses in Engineering with Intermediate in Science as the admission qualification. Certain institutions however, particularly, in the former Bombay State and the Roorkee University conducted three-year courses after Intermediate. There was no satisfactory answer to the question of equivalence between the Four-Year and Three-Year Degree courses. For the purposes of employment, however, the Central Government had accepted both on a par.

4. The position in Maharashtra and Gujarat States remains unaltered where the new system of Secondary Education has not been accepted. The old three-year degree courses in Engineering after Intermediate will continue. The Roorkee University has decided to introduce a four-year degree course after Intermediate. All other State institutions in Uttar Pradesh are also conducting four-year degree courses in Engineering after Intermediate.”

(b) *Inclusion of Reference and Guided Reading as a part of Sessional Work in degree course*

NOTE RECEIVED FROM THE STATE GOVERNMENT OF MADHYA PRADESH

1. “It is not possible to give all the available engineering knowledge to the student during the four years of his stay

in the college and after entering the profession, the student has to depend on reference work to get at the particular information he wants. It is found as a general rule that because of lack of any previous experience in the matter, he finds it very difficult to do reference work and ultimately leaves off learning any new things.

2. It is therefore a matter for consideration whether faculties of the various universities be requested to consider the inclusion at the fourth year level of the course to include some sessional marks for guided reading and reference work. Every student should be given definite topics for this purpose and at least two hours per week should be devoted by him to find out information about these topics. Due to the continuous advance of engineering knowledge this step appears very necessary, at least to keep the student realised about the continuous expansion of knowledge and methods of trying to know some thing about the same."

(c) *To consider the question of providing hostel accommodation for more than 50% students in some engineering colleges.*

NOTE RECEIVED FROM THE GOVERNMENT OF MADHYA PRADESH

1. The Council has recommended and Government of India have decided that residential accommodation to only 50% of the student body should be allowed in engineering colleges. This serves the purpose when and if the college is situated in a big city, wherein accommodation can be found for the rest of the student body. A large number of engineering colleges are not however so happily situated. Some of them are far away from big cities and as such the students find it very difficult to find suitable accommodation. In many instances the hostels have been crowded up to meet the situation. This naturally has resulted in lowering of standards as well as discipline.

2. Normally, an engineering institution should run in two shifts, the morning shift being utilised for theory classes and the afternoon devoted to laboratories, workshops and practicals to give best results.

3. It is therefore a matter for consideration that at least certain selected institutions in every State should be given 100% hostel accommodation depending on their location and availability of residential accommodation nearby.

NOTE FROM THE SECRETARIAT OF THE COUNCIL

4. The Co-ordinating Committee at its meeting held in July, 1956 considered the general question of the scale of hostel accommodation to be provided in each technical institution for which interest-free loans might be sanctioned by the Central Government. It was decided that the following principles should be followed uniformly for all institutions :—

- (a) Where an institution functions as residential, hostels accommodation should be provided for entire student body ;
- (b) For non-residential institutions, the hostel accommodation should be for a maximum of 50% of the student body ;
- (c) For non-residential institutions located in large cities or in isolated places or in special areas where the students find it difficult to get alternative residential accommodation on their own, additional hostel accommodation over and above what is proposed in (b) above should be provided. The case of each institution should, however, be examined on its own merits and the total provision for hostels determined.

5. The Co-ordinating Committee also decided that the cases of all institutions including those for which loans for hostels had been recommended, recently, but not paid should be reviewed on the basis of the above principles and the amount of the loan in each case determined accordingly.

C. PROPOSALS RECEIVED FROM THE GOVERNMENT OF PUNJAB

- (a) *Import of equipment for Government Technical Institutions in the Punjab State*

NOTE RECEIVED FROM THE GOVERNMENT OF PUNJAB

1. "In the various Government Technical Institutions in the State, a lot of equipment is required for the purposes of Instructional work. Some portion of the above equipment is not readily available in the country and is required to be imported from abroad. The Government of India who were approached previously to help this Department in the matter of procurement of equipment from abroad and intimated that they are constituting a "Stores Purchase Cell" shortly, which will examine such cases. The above stores purchase Cell has not been established so far and when the Government of India were asked to take some effective steps in this

behalf, as in the absence of proper equipment, the instructional work in the Institutes is suffering badly, they informed that the matter is still under examination with them and till the above cell is constituted, the State Governments may take steps for the procurement of equipment from the Foreign Countries themselves direct.

2. The equipment in the foreign countries can be arranged either through the Director General of Supplies & Disposals or the Indian Embassies. The Director of Technical Education has not been declared as an Indenting Officer on the Director General of Supplies and Disposals nor he is empowered to correspond with the Indian Embassies in the foreign countries direct, with the result that no headway could be made in the matter. The budget allotment sanctioned by the State Government for the purchase of equipment in the Engineering Institutes as also the Central assistance sanctioned by the Government of India from year to year is not being consumed fully and lot of surrenders/lapses are occurring in the above allotments every year due to the reason that most of equipment is not available in the country and proper system for the arrangement of the same from abroad has not been set up so far. In order to equip the Institutes properly, it is suggested that the Director, Technical Education, Punjab may be declared as Indenting Officer for the Director General of Supplies & Disposals for the equipment which is not available in the country. This matter may please be taken up with the appropriate authorities at the higher level by the Northern Regional Committee so that the position of equipment in the Government Technical Institutes in the Punjab State could be improved."

NOTE FROM THE SECRETARIAT

3. The Co-ordinating Committee at its meeting held on 1st March, 1960 recommended that a Central Agency should be set up to facilitate the procurement of equipment from abroad for technical institutions. The Co-ordinating Committee was of the view that the Director General of Supply & Disposals should function as the Central Agency and should set up a Cell specifically for the purpose. This matter has been taken up with the Director General of Supply & Disposals and discussions are being held on the question of how the Cell should be set up and various other details. Till a decision is reached, the Ministry can take up with the authorities concerned, the question of authorising the Director of Technical Education, Punjab as an Indenting Officer for Director General of Supply & Disposals.

(b) *Continuation of central assistance to technical institutions for recurring expenditure*

NOTE RECEIVED FROM THE GOVERNMENT OF PUNJAB

1. "The Government of India have recently accorded approval to the implementation of three Centrally Sponsored Polytechnics in the Punjab *i.e.*, Polytechnics at Sirsa, Guru Teg Bahadurgarh and Batala on the pattern of assistance followed in the 2nd Five Year Plan period *i.e.*, Government of India will bear 50% of the expenditure on instructional buildings and equipment the balance 50% to be borne by the State Government. The Central Government will also provide 50% of the recurring expenditure (net deficit after taking into account income from Tuition Fee etc.) for a period of five years and balance to be borne by the State Government during the five year period and the entire recurring expenditure thereafter. It is presumed that this sharing pattern will also apply to other continuing schemes as well as new schemes during the 3rd Five Year Plan. The question of financing of recurring expenditure deficit of the private Technical Institutions was discussed in a meeting held at Chandigarh on 9th April, 1959 between the representatives of the Government of India, State Government and the Institutions. It was decided that State Government should forward a note to the Government of India explaining the state point of view for their consideration. The requisite note has since been forwarded by the Secretary to Government of Punjab, P.W.D. B&R/P.H. Branches, Chandigarh *vide* letter No. 4476-BRI-61/15535, dated 23-5-1961 to Shri L. S. Chandrakant, Deputy Educational Adviser, Government of India, Ministry of Scientific Research and Cultural Affairs, New Delhi (copy of which is attached—Annexure XIII). It is requested that the matter may be taken up in the Meeting and decision arrived at in this behalf."

NOTE FROM THE SECRETARIAT

2. During the Second Plan period the Central Government agreed to assist in the establishment of technical institutions by State Governments and private agencies in the following manner :

Government institutions.—The Central Government will meet 50% of the approved expenditure on buildings and equipment. The balance should be borne by the

State Governments concerned. The Central Government will also bear 50% of the recurring expenditure upto the end of the Second Plan period *i.e.* upto 1960-61. After the Plan period, the entire recurring expenditure should be borne by the State Governments.

Private institutions.—The Central Government will meet 50% of the approved expenditure on buildings and equipment, and 50% of the recurring expenditure upto the end of the Second Plan period. The balance of the non-recurring expenditure as also 50% of the recurring expenditure upto the end of the Plan period, should be borne by the private agencies themselves or in association with the State Governments concerned. After the plan period, the entire recurring expenditure should be borne by the private agencies and State Governments concerned.

3. Wherever, technical institutions have been established by private agencies in accordance with the above formula the State Governments concerned have given the assurance that for all these institutions the entire recurring expenditure after the Plan period would be borne by the private agencies and themselves. The Central Government is therefore not committed to share any portion of the recurring expenditure after the Second Plan period.

4. The question of how the deficit in the recurring expenditure of private institutions in Punjab should be met after the plan period was discussed at a meeting held at Chandigarh on 9th April, 1959 between the representatives of the Central Government, the State Government and the institutions. The representatives of non-Government institutions explained that unless the Central Government and the State Government shared in the deficit of recurring expenditure after the Second Plan period, they would not be able to stand on their own legs. The position of the Central Government and the State Government was explained by the representatives concerned. It was finally, decided that the State Government should send, for the consideration of the Central Government a note explaining their point of view. The note has since been received and is appended (Annexure XIII).

5. The Central Government are considering at present a proposal that in the case of institutions started during

the Second Plan period, grants-in-aid for recurring expenditure should be given for a full period of five years from the date of starting of the institutions since it takes at least five years for a technical institution to be fully established. In the Chief Ministers' Conference held at New Delhi on 13th May, 1959 the need for formulating a grant-in-aid code by each State Government was discussed. The conference agreed in principle that for the stability of non-Government institutions in the various States, a grant-in-aid code, which would assure the private institutions of specific grants, should be laid down.

ITEM No. 20.—To consider the report of the Special Committee for Commerce Education

In April, 1958, the Chairman, All India Council of Technical Education appointed a committee consisting of the following persons to report on all aspects of improvement and development of commerce education in the country :—

1. Dr. V. K. R. V. Rao, (*chairman*)
Vice-Chancellor,
Delhi University,
Delhi. (Now Director, Institute of Economic Growth).
2. Dr. P. S. Lokanathan,
Director General,
National Council of Applied Economic Research,
New Delhi.
3. Prof. B. N. Das Gupta,
Member, Life Insurance Corporation,
Calcutta.
4. Dr. S. K. Basu,
Head of the Department of Commerce,
University of Calcutta,
Calcutta.
5. Prof. P. D. S. Mudaliar,
Principal, University College of Commerce,
Madras.
6. Shri Jagdish Prasad,
Managing Director,
Indian Telephone Industries Ltd.,
Bangalore.
7. Shri C. S. Tayabjee,
Azam Jahi Mills Ltd.,
Hyderabad.

8. Shri S. Shamsheer Ali,
6-Rainey Park, Ballygunj,
Calcutta.
9. Shri K. T. Merchant,
Principal, Sydenham College of Commerce,
Bombay.
10. Dr. P. J. Phillip,
Development Officer,
University Grants Commission,
New Delhi.
11. Dr. A. N. Agarwala,
Head of the Department of Commerce,
Allahabad University,
Allahabad.
(Representing the Inter-University Board).
12. Shri S. V. Ghatalia,
Vice Shri S. Vaidyanatha Aiyer (Deceased)
(Representing the Institute of Chartered Accountants
of India).
13. Prof. M. L. Tannan,
(Representing the Indian Institute of Bankers',
Bombay).
14. Prof. Norman C. Hunt,
Edinburgh University,
United Kingdom.
15. Prof. Ira D. Anderson,
Northwestern University,
U.S.A.
16. Prof. A. Dasgupta, (*Member-Secretary*)
Delhi School of Economics,
Delhi.

2. The terms of reference of the Committee were as follows :—

- (a) To enquire into and report on the present position of commerce education in India in all its aspects ; and
- (b) Suggest measures for its re-organisation and improvement with particular reference to :
 - (i) the aims, organisation and content of commerce education;
 - (ii) its relationship to existing and proposed courses of education in Business Management;

- (iii) the inter-relation of commercial schools and colleges with schools and colleges of other types; and
- (iv) other allied problems

so that a sound and reasonably uniform system of commerce education suited to the needs and resources of our developing economy may be provided for the whole country.

3. The Committee held seven meetings. In addition to issuing Questionnaire to collect detailed information from professional organisations, industrial and business concerns, universities and institutions, State Governments etc., the Committee met a large number of eminent persons in the fields of Commerce education and industrial and commercial enterprise.

The report of the Committee that has been finalised will be formally submitted on 5th July, 1961, to the Minister for Scientific Research and Cultural Affairs. Meanwhile, the member-Secretary of the Committee has prepared a Note giving briefly the recommendations of the Committee. A copy of the Note together with a copy of the Report will be circulated to the members of the Council separately.

ITEM NO. 21.—To consider the question of reservation of seats for Ex-State students in Technical Institutions

1. The All India Council for Technical Education at its meeting held on 30th April, 1960, considered the question of reservation of seats for candidates coming from outside the State in which a particular college is situated. The Council was of the view that when facilities for engineering education have been expanded on an extensive scale all over the country and at least one engineering college has been established in each State, there would be no need to reserve seats for the students of individual States. Some provision for reserved seats would, however be necessary for the Centrally Administered areas which do not have institutions of their own. The Council, further noted that in some of the State institutions the existing rules do not permit any candidate from outside the State concerned to seek admission. The Council was of the view that such restrictions should be done away with and the institutions should be opened to students from all over the country. It should be the endeavour of each institution to admit some candidates from outside the State.

2. The recommendations of the All India Council were considered by the Central Government which observed that difficulties were experienced by students in securing admissions to technical institutions due to domicile restrictions imposed by certain States. The domicile restrictions exist in varying degrees in different States which preclude the admission of students of one State in institutions of another State. Such restrictions might have had their origin in the extremely limited facilities for technical education available some time back. The present position of Technical Education in the country, however, is entirely different. A large number of institutions have been established and existing institutions have been expanded all over the country. In this programme of expansion and development the Central Government has extended assistance in a large measure to all State Governments, Universities and private agencies. The Central Government has also sanctioned the establishment of new institutions in different States under Centrally-sponsored schemes. With this large-scale expansion of Technical Education in all the States, the Central Government was of the view that the practice of domicile restrictions followed so far was not justified in the present situation. In addition, the domicile restrictions inhibited the growth of a feeling of oneness in the country, specially in the field of education.

3. The Central Government, therefore, wrote to all State Governments to suggest that at least 25% of the seats in technical institutions in each State may be reserved for students belonging to other States subject, however, to the condition that the latter fulfilled the prescribed requirements of admission. The reactions of the State Governments to this suggestion are summarised in the notes below :—

Sr. No.	Name of the State	Reply/Comment
1	Andhra Pradesh	Considerable difficulty is experienced by students of the State in securing admission to engineering colleges and polytechnics. Time is not ripe for removing domicile restrictions. The three engineering colleges in the State are managed by Universities and it is not likely that they would agree to the proposal. State Government have suggested that reservations existing at Regional Engineering College, Warangal may be considered adequate for the present.

Sr. No.	Name of the State	Reply/Comment
2	Assam	Even now some seats are reserved for students from Union Territories, Orissa and Jammu & Kashmir. The State Government have suggested that reservation on a strict principle of percentage is not necessary. They are, however, agreeable to consider requests from other states for further seats if and when any such occasion arises
3	Bihar	In private colleges <i>viz.</i> the Birla Institute of Technology 75% of the students come from other States. The Regional Colleges takes 50% of the students from outside the State. As regards State Colleges, certain criteria have been laid down for admission of students of other States as a result of which 10 to 15 percent students from outside the State get admissions. Thus there is plenty of scope for emotional integration among students of various States in the Engineering Colleges in Bihar. State Government have stated that since the total number of seats available at present in the State fall short of the requirements, it is not considered feasible to admit more students of other States than what are being admitted.
4	Gujarat	The State Government have agreed to reserve 15% of seats for Ex-State students provided the arrangement is reciprocal and similar reservation is made for the students of the State by other States.
5	Jammu & Kashmir	Provision for reservation of seats exist in the scheme for Regional Engineering College, Srinagar. As regards Polytechnics students from outside the State are provided but in view of the growing needs of the State it is not possible to commit to a specific percentage of the intake. The question will be reviewed keeping in view the requirements of the State and training facilities that are provided to students of the State in other parts of the country.

Sr. No.	Name of the State	Reply/Comment
6	Kerala	<p>The intake of students in the technical institutions of the State are very inadequate even to admit students from various districts of the State. They have already reserved 9 seats for Jammu & Kashmir and Orissa students and Government of India nominees. State Government, therefore, does not consider it desirable to reserve any additional seat. They have suggested that the pattern of admission may continue for some more time.</p>
7	Madras	<p>The State Board of Technical Education has suggested that reservation of seats for Ex-State students should be decided at an all India Conference in which all the States should participate and that the decision by an individual State to increase the quota of reservation for Ex-State students without other States doing so will be practically of no use. They have suggested that the Government of India might examine the feasibility of working out a scheme of exchange of students for this purpose by all States.</p> <p>The State Government agrees with the above views of the Board.</p>
8	Maharashtra	<p>Proposal not acceptable for following reasons:—</p> <ul style="list-style-type: none"> <li>(i) The State of Maharashtra have been running short of seats in engineering colleges on bifurcation of the erstwhile Bombay State. <li>(ii) The net result of the making reservation by each state for ex-State students will be the same as that without any reservation. The proposed reservation, therefore, would not have any advantage of its own. <li>(iii) Admission to engineering colleges in the State (excepting Regional Engineering College, Nagpur) are now based not on domicile but on the basis of students having passed

Sr. No.	Name of the State	Reply/Comment
		<p>the qualifying examination from any University within the State. The present rules, therefore, do not preclude students of other States getting admission provided they pass the qualifying examination from any University in the State. Even now some seats are reserved for ex-State students in the Regional Engineering College, Nagpur, Engineering College, Poona and Victoria Jubilee Technical Institute, Bombay.</p>
		<p>The Government of Maharashtra are of the view that understanding among the people of the country and feeling of oneness can be achieved by qualified students taking up jobs in firms, institutions, etc., in other States and to achieve the same at the student stage does not appear to them feasible.</p>
9	Mysore	<p>The existing pattern of admissions in the technical institutions in the State may continue for some more time. However, the State Government agrees to consider the proposal favourably, if all other State Governments agree.</p>
10	Orissa	<p>Agree to the proposal in principle. Have suggested that since the State is less advanced in Technical Education reservation should be only 10% during 3rd Plan period and thereafter the State Govt. would have no objection to accept the Central Govt. advice <i>in toto</i>.</p>
11	Rajasthan	<p>Recommendation is already being implemented by the M.B.M. Engg. College. 50% of seats are filled by open selection from among applicants of other States.</p>
12	Uttar Pradesh	<p>No domicile restrictions exist at present for admission to the Agra and Roorkee Universities and Diploma institutions controlled by the State Board of Technical Education and Training, Uttar Pradesh. Aligarh and Banaras Universities also have no domicile restrictions for admission and the latter have fixed state-wise quota for admission to the Engineering and Technological Colleges under it.</p>

Sr. No.	Name of the State	Reply/Comment
13	West Bengal	<p>At present the State has reserved 30 seats—15 for degree and 15 for diploma courses in Engineering for students from neighbouring States. The admission test for the Degree course in Bengal Engineering College, Sibpore is conducted at Cuttack, Calcutta, Agartala and Gauhati. Students who are residents of Eastern Region are allowed to sit for the examination provided they satisfy the age and academic qualifications. Students from other parts of India are also allowed to appear for the admission test at Calcutta. The same principles apply in the case of Diploma courses. In the circumstances the State Government feel that there is no need to change the present system. They hold that reservation of seats is always undesirable and free open competition is the most desirable method of admission.</p>

Governments of Punjab and Madhya Pradesh have stated that the matter is under their consideration.

ITEM NO. 22.—To receive a note on the Third Five Year Plan of Technical Education

1. The All India Council for Technical Education at its last meeting held on 30th April, 1960, considered the report of the Working Group on Technical Education and Vocational Training appointed by the Planning Commission for the formulation of the Third Five Year Plan. The council agreed generally with the approach made by the Working Group to the problems of development of Technical Education under the Third Five Year Plan and endorsed the various recommendations made by the Group subject to certain observations. Since then, the Plan has been formulated both for the States and for the Centre in consultation with the Planning Commission. The main features of the Plan are given below :

Targets for First Degree and Diploma courses

2. In 1960-61 *i.e.*, the last year of the Second Plan, the number of institutions for first degree courses increased to 100 with an admission capacity of 13,858 students per year.

This includes one Engineering College provided for in the Third Five Year Plan of Bihar State but started by the State Government in January, 1961 at Bhagalpur. The Working Group had suggested that the target for the Third Five Year Plan should be 5,000 additional seats. In the Plans formulated, provision has been made to reach an admission capacity of 19,137 students per year in the following manner. This is inclusive of the Bhagalpur College whose capacity has to be taken into account as development under the Third Plan :

- (a) By the establishment of 19 more institutions to yield 3,460 additional seats. These 19 institutions include one Regional Engineering College sanctioned under the second Five Year Plan but yet to start functioning at Allahabad; a new College of Engineering and Technology at Delhi in the Central Sector, a College in the Private sector approved in the Second Plan but yet to start functioning ; and 16 new Colleges in the State's Sector inclusive of the Bhagalpur College that has already started functioning.
- (b) By the expansion of the capacity of some of the existing institutions in the States' sector so as to secure 1,369 additional seats.
- (c) By developing the Higher Institutes of Technology at Bombay, Madras and Kanpur to their full capacity—570 additional seats.

3. As regards diploma courses, the position in 1960-61 was that there were 196 institutions with an admission capacity of 25,571 students per year. The target suggested by the Planning Commission is 10,000 additional seats by the end of the Third Five Year Plan period. In the plans formulated it is proposed to reach a target of 37,391 seats for diploma courses by the end of the Plan period in the following manner :-

- (a) By the establishment of 67 new institutions with an admission capacity of 9,310 students that include 18 institutions sanctioned during the Second Plan period but yet to start functioning.
- (b) By the expansion of some of the existing institutions so as to secure 2,510 additional seats.

4. The above targets relate to full-time courses. The State Plans also include provision for part-time courses, both for

degree and for diploma. Since the detailed schemes for the organisation of facilities for part-time courses in different States have not yet been formulated, it is not possible to indicate at this stage the number of additional seats that would be provided for part-time courses during the Third Plan period.

5. During the Second Plan period, 38 Junior Technical Schools have been established in different States. Under the Third Five Year Plan, provision has been made for the establishment of 96 additional schools which include one school sponsored by the Government of Maharashtra in the private sector.

Financial Provision

6. The Central Government estimated initially that for the implementation of the Plan as formulated by the Working Group, an outlay of about Rs. 201 crores would be necessary for the Plan period. The State Plans as approved by the Planning Commission provide for an outlay of Rs. 71·38 crores. So far as the Centre is concerned, the Ministry had suggested an estimate of Rs. 96·15 crores. This was later reduced to Rs. 86·61 crores, after a discussion with the Secretariat of the Planning Commission. The present position is that the Planning Commission has indicated for the centre a "Programme limit" of Rs. 70 crores and a "Financial provision" of Rs. 45 crores for the Plan period. So far as the Centre is concerned, there has been a drastic reduction in the estimates proposed by the Ministry. Further, the limit of Rs. 45 crores for "financial provision" makes the position even more difficult inasmuch as the gap between the "Programme limit" and the "Expenditure limit" is as high as Rs. 25 crores. If the actual outlay on the development of technical education during the Third Plan period is restricted to the financial provision of Rs. 45 crores, it will be extremely difficult for the Central Government even to complete the schemes undertaken during the Second Plan period with the approval of the Planning Commission. The Ministry has, therefore, suggested to the Planning Commission that the financial provision should be raised at least to Rs. 70 crores, the same as the programme limit. Even on this basis a drastic revision of the Central Plan would be necessary as indicated in this note under the appropriate schemes. The distribution of the outlay of Rs. 70 crores between the various schemes in the Central Sector is given in Annexure XIV.

Regional Engineering Colleges

7. Seven additional Regional Colleges are proposed to be established during the Third Plan period, one in each of those States that have not been allotted any Regional College in the Second Plan. The States concerned are Gujarat, Kerala, Orissa, Rajasthan, Punjab, Madras and Assam. In view of the revised Plan allocation made by the Planning Commission it is proposed that two of the new Regional Colleges be started during the first two years of the Plan period ; two Colleges in the third year of the Plan period, two Colleges in the fourth year of the Plan period and one College in the last year of the Plan period. Accordingly, the establishment of the Regional Colleges in Gujarat and Kerala has been sanctioned.

Specialised Institutions

8. The Central Plan includes the establishment of two All India Institutes of Management Studies at Calcutta and Ahmedabad, a Central School of Printing Technology, a National Institute For Training in Industrial Engineering, a National Institute For Foundry and Forge Technology and a Teacher Training Institute. The establishment of the Management Institutes as also of the Institute for Training in Industrial Engineering has been sanctioned. In view of the programme limit of Rs. 70 crores the establishment of the Central Printing Institute, the Foundry and Forge Institute and Teacher Training Institute can only be undertaken in the latter half of the Plan period.

Scholarships

9. The State plans include a provision of about Rs. 4.32 crores for scholarships to be awarded by State Governments in their own institutions, partly as fully paid scholarships and partly as loan scholarships. The Central Plan as originally formulated envisaged an outlay of Rs. 7 crores for scholarships, half of which was for Merit-cum-Means scholarships and another half for Loan Scholarships. In view of the reduction in the Plan outlay for the Centre, the provision for scholarships has been reduced to Rs. 3.32 crores which will be utilised mainly for the Merit-cum-Means scholarships scheme initiated in 1959-60. At the Higher Technological Institutes as also at the Regional Colleges a built-in provision for the award of scholarships to 25% of the students exists within the project estimates of those institutions. All factors considered, the provision now made in the Third Plan will enable

us to cover 18% of the students by scholarships as against the present figure of 5%. The Working Group had, however, suggested that at least 25% of the students should be covered by scholarships.

Staff Quarters

10. In view of reduced Plan allocation the scheme of construction of staff quarters for technical institutions has been dropped.

Loans for Hostels

11. The provision made for this purpose in the revised Central Plan is of the order of Rs. 6 crores. Against this provision, loans amounting to Rs. 4.33 crores have already been approved for institutions under the Second Plan, which have to be paid during the current Plan period. The amount, therefore, available for loans to be given to new institutions is, only Rs. 1.67 crores which, however, will be inadequate for providing hostel accommodation for 50% of the students in those institutions.

Technical Institutions for Girls

12. The Central Government has formulated a scheme in broad outline for the establishment of technical institutions for girls. The scheme envisages three cycles of training as given below :

- (a) Primary cycle for age group 11+ Terminal age 15+
- (b) Secondary cycle for age group 14+ Terminal age 17+
- (c) Tertiary cycle for age group 16/17+ Terminal age 18/20+

The fields of training have been so chosen as to fit in for a particular age group concerned, general education background of the students, occupational importance and other factors. In the primary and secondary cycles, general education is continued along with technical or professional training. The tertiary cycle corresponds to the normal polytechnic type of education though the fields chosen are different from those of a conventional polytechnic. A copy of the scheme is given at Annexure XV. The scheme has been sent to all State Governments for implementation. The State Governments have also been requested to give their suggestions on the scheme.

The Third Five Year Plans of State Governments as approved by the Planning Commission provide for the establishment of 24 technical institutions for girls in different states.

Part-time and Correspondence Courses

13. The Central Working Group had suggested that provision should be made for 1,000 seats at degree level and 5,000 seats at diploma level for part-time courses and correspondence courses. A limited provision has been made in the State Plans for the development of facilities for part-time courses. In the revised Central Plan a provision of Rs. 55 lacs has been made for the same purpose.

14. The Central Government deputed recently Shri S. C. Sen, Principal, Delhi Polytechnic, to visit the U.K., U.S.A. and U.S.S.R. to study the organisational and other aspects of correspondence courses in those countries and to submit a detailed report on the lines on which such facilities should be developed in this country. Shri Sen has completed his assignment and his report is awaited.

ITEM NO. 23.—To report the appointment of a Working Group of the Council for formulating a Scheme for training of technical teachers with diploma qualifications for Polytechnics

A major problem confronting us in the field of technical education is the serious shortage of teachers. The difficulty in obtaining staff of the right calibre and in required number is a serious limitation to the further development of technical education in the country. If in spite of this, new institutions are established in large numbers, there is a risk of lowering standards of education and training.

2. To tackle the problem of shortage of teachers, the Central Government initiated under the Second Five Year Plan the following programmes for training of young bright engineering graduates as teachers :—

- (i) normally one to two years training in U.S.A. in collaboration with T.C.M.
- (ii) about 3 years' training in selected institutions in India.

3. The Teachers' Training Programme which is now in operation is restricted only to engineering graduates and they will form the pool of teachers catering mainly for Engineering Colleges. Suitable scheme is, therefore, required to be evolved for the training of teachers for polytechnics.

4. The Chairman of the All India Council for Technical Education has, therefore, appointed a Working Group of the Council under the Chairmanship of Shri C.V.D. Murthy, Director of Technical Education, Andhra Pradesh, to formulate a scheme for training of teachers with Diploma qualifications for Polytechnics.

5. The Working Group is scheduled to meet at New Delhi on the 8th & 9th July, 1961.

6. The matter is reported to the Council for information.

7. In this connection the Working Group may also like to examine the present staff structure in polytechnics and the qualifications of various categories of staff, as prescribed by various Regional Committees and suggest modifications thereof.

ITEM NO 24.—To consider the recommendations of the fourth meeting of the Pharmaceutical Education Committee held on the 17th June, 1961

The fourth meeting of the Pharmaceutical Education Committee was held on the 17th June, 1961 at New Delhi. The main recommendations and decisions of the Committee are as given below :—

1. The Co-ordinating Committee at its meeting held on the 1st November, 1960 approved the recommendations of the Pharmaceutical Education Committee in respect of the four year integrated course for B. Pharm. degree. The Pharmaceutical Education Committee has now finalised the syllabus and model list of accommodation, equipment and staff, etc. for the course. The detailed syllabus and the model list of instructional facilities are given at Annexure XVI.

As regards Post-graduate courses in Pharmacy, the Committee was of the view that the Master's degree course in Pharmacy could only develop as a logical sequel to the undergraduate course after the latter had been fully developed at an institution and not built from the top. It should be organised in a highly selective manner at a few centres where all the facilities for under-graduate studies especially staff are available. Every care should, therefore, be taken in the selection of institutions in order to ensure that they are qualified to undertake post-graduate activity in this field.

The Committee decided that the institution desirous of starting M. Pharm. courses should be requested to submit their detailed proposals by specified date. They should also

indicate how far, facilities for the under-graduate course have been developed, the present staff position together with the qualifications and experience of existing teachers, and the particular electives which the Institution proposes to offer in the post-graduate course. When such proposals are received, they would be examined by the Committee and after selecting the most suitable centres, final recommendations would be made regarding the assistance to be provided to them for organising post-graduate courses in Pharmacy.

2. The Pharmaceutical Education Committee at its third meeting held on the 27th April, 1961 appointed a Visiting Committee to visit the following institutions and assess the requirements for development/improvement of their Departments of Pharmacy :

- (i) Department of Pharmacy, Nagpur University, Nagpur.
- (ii) Deptt. of Pharmacy, Saugar University, Sagar.
- (iii) Deptt. of Pharmacy, Birla College, Pilani.
- (iv) Deptt. of Pharmacy, Punjab University, Chandigarh.
- (v) Deptt. of Pharmacy, Maharaja's College, Ernakulam.
- (vi) L. M. College of Pharmacy, Ahmedabad.

The Committee considered the reports of the Visiting Committee and expressed the view that the reports of the Visiting Committees revealed that generally the position in the institutions inspected was very unsatisfactory. The institutions had made no serious effort to re-organise the course, to provide the necessary instructional facilities and to appoint qualified and adequate staff. There was also no indication that the authorities of the institutions had clear cut plans for an improvement of the position; nor had they made any definite estimates of cost of development of the institutions, their own resources to undertake the development and the assistance required from the Central Government or the University Grants Commission. The Committee thought that under these circumstances it would not be satisfactory to recommend grants on a hypothetical basis. In the first place, the institutions must show greater initiative to improve the courses of study and the instructional facilities and formulate specific schemes for the purpose. The Committee, therefore, recommended that the report of the Visiting Committee (after suitable editing) should be forwarded to each institution

along with the prepared scheme for a four-year degree course and the model list of instructional facilities. The institutions be then requested to state :—

- (a) Whether they accept the scheme of four-year B. Pharm. Degree course as approved by the A.I.C.T.E. and the date from which they propose to implement it with such minor modifications as may be necessary to suit local conditions.
- (b) Whether they would agree to provide the necessary instructional facilities for the introduction of the four-year course, if Central assistance in accordance with the usual pattern was available. The non-Central part of the expenditure would have to be borne by the institutions either from their own resources or in association with the State Governments concerned.

The Institutions that accept the above may be requested to formulate detailed proposals including estimates of cost. These proposals when received, will be examined by the Committee which will make final recommendations regarding the financial assistance to be given to the institutions concerned.

(3) The Committee considered the requestes of the Banaras Hindu University for financial assistance for changing over from three year-course in Pharmacy to four-year integrated degree course and the Institute of Pharmacy, Patna for starting a degree course in Pharmacy and decided that the same procedure as laid down under para 2 above should be followed in these cases. The detailed proposals, when received from the Univeritsy/State Government would be considered by the Committee. The Committee further decided that the Government of Bihar may be requested to consider whether it would not be more appropriate to start a Department of Pharmacy in an existing technical institution in the State.

(4) While considering the question of giving financial assistance to institutions for conducting diploma course in Pharmacy, at its meeting held on the 22nd April, 1961, the Pharmaceutical Education Committee recommended that the diploma course in Pharmacy should be of three years duration after Matriculation in accordance with the normal pattern of diploma courses in Engineering and Technology as laid down by the All India Council for Technical Education. It was decided that the Pharmacy Council of India should

work out the details of the course in conformity with the statutory requirements prescribed and the model list of instructional facilities. On receipt of these details from the Pharmacy Council, the matter would be further examined. In view of the fact that no reply has been received from the Pharmacy Council and the delay that has already occurred, the Committee suggested that a joint Sub-Committee consisting of the representatives of the Pharmaceutical Education Committee and the Pharmacy Council be set up to formulate the course. It was decided that the following persons be appointed on the Sub-Committee from the Pharmaceutical Education Committee's side :—

1. Dr. B. Mukherji. (Convener).
2. Prof. M. L. Schroff.
3. Prof. S. Rangaswami.

The Pharmacy Council may be requested to nominate three persons on the Sub-Committee.

(5). The Committee considered the proposal from the Jammu and Kashmir University for starting a College of Pharmacy in the State of Jammu & Kashmir, and agreed in principle that facilities for a B. Pharm course be developed in Jammu & Kashmir and for that purpose a Department of Pharmacy may be established either under the Jammu & Kashmir University or in a suitable technical institution in the State as for instance the Regional Engineering College, Srinagar. The Committee decided that the scheme of the four-year integrated B. Pharm course, together with the model list of instructional facilities should be sent to the University which should formulate detailed proposals for starting a Department of Pharmacy in consultation with the State Government.

(6) The Committee decided that the Jadavpur University's request for starting a degree course in Pharmaceutical Engineering be considered after the draft syllabus and other details of the course had been prepared by the Sub-Committee appointed for the purpose.

ANNEXURES

ANNEXURE I

(Item No. 2)

All India Council for Technical Education

LIST OF MEMBERS

- | | |
|---|--|
| (a) Chairman (<i>Ex-officio</i>) | 1. Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs, Government of India, New Delhi |
| (b) (i) Educational Adviser (Tech) to the Government of India (<i>Ex-officio</i>) | 2. Prof. M. S. Thacker, Educational Adviser (Technical), Ministry of Scientific Research & Cultural Affairs, New Delhi |
| (ii) Educational Adviser to the Government of India (<i>Ex-officio</i>) | 3. Shri P. N. Kirpal, Secretary, Ministry of Education, New Delhi |
| (c) Chairmen of the Regional Committees of the Council (<i>Ex-officio</i>) | |
| Eastern Regional Committee | 4. Shri J. J. Ghandy, Director, Tata Iron & Steel Co., Jamshedpur |
| Western Regional Committee | 5. Shri Kasturbhai Lalbhai, Pan-kora Naka, Ahmedabad |
| Northern Regional Committee | 6. Lala Shri Ram, 22-Curzon Road, New Delhi |
| Southern Regional Committee | 7. Dr. A. L. Mudaliar, Vice-Chancellor, Madras University, Madras |
| (d) Chairmen of the All India Boards of Technical Studies (<i>Ex-officio</i>) | |
| Commerce | 8. Dr. V. K. R. V. Rao, Director, Institute of Economic Growth, Delhi University, Delhi |
| Textile Technology | 9. Lala Shri Ram, 22-Curzon Road, New Delhi |
| Engineering & Metallurgy | 10. Shri N. K. Mitra, 16, Hindustan Road, Rashbehari Avenue, Calcutta |

- | | | |
|--|-----|--|
| Architecture & Regional Planning | 11. | Shri M. Fayazuddin, Chief Town Planner, Government of Andhra Pradesh, Hyderabad |
| Chemical Engineering & Chemical Technology | 12. | Dr. G. P. Kane, Senior Industrial Adviser (Chem), Ministry of Commerce & Industry, Development Wing, New Delhi |
| Applied Art | 13. | Prof. V. N. Adarkar, Principal, J. J. Institute of Commercial Art, Bombay |
| Management | 14. | Shri J. J. Ghandy, Director, Tata Iron & Steel Co., Jamshedpur |
- (e) Representatives of Ministries/ Departments of Government of India
- | | | |
|---------------------------------------|-----|---|
| Commerce & Industry | 15. | Dr. B. D. Kalelkar, Senior Industrial Adviser (Engg.), Development Wing, Ministry of Commerce & Industry, New Delhi |
| Defence | 16. | Secretary, Ministry of Defence, New Delhi (or his nominee) |
| Finance | 17. | Financial Adviser, (Scientific Research and Cultural Affairs), Ministry of Finance, New Delhi |
| Labour and Employment (D. G. E. T.) | 18. | Director General of Employment & Training, New Delhi |
| Ministry of Steel, Mines and Fuel | | |
| (i) Deptt. of Mines & Fuel | 19. | Secretary, Department of Mines & Fuel, Ministry of Steel, Mines & Fuel, New Delhi (or his nominee) |
| (ii) Department of Iron & Steel | 20. | Shri M. C. Misra, Under Secretary, Ministry of Steel, Mines and Fuel, Department of Iron & Steel, New Delhi |
| Ministry of Works, Housing and Supply | 21. | Shri V. K. Rao, Joint Secretary, Ministry of Works, Housing and Supply, New Delhi |
| Ministry of Irrigation & Power | 22. | Dr. K. L. Rao, Member, Central Water & Power Commission, New Delhi |

- Ministry of Railways . . . 23. Director, Mechanical Engineering, Railway Board, New Delhi
- Ministry of Home Affairs (Directorate of Manpower) 24. Shri R. Prasad, Joint Secretary, Ministry of Home Affairs (Directorate of Manpower), New Delhi
- Ministry of Food & Agriculture 25. Shri S. Mullick, Joint Secretary, Department of Agriculture, Ministry of Food & Agriculture, New Delhi
- Ministry of Information and Broadcasting 26. Shri A. C. Ramchandani, Chief Engineer, All India Radio, New Delhi
- Ministry of Transport and Communication
- (i) Department of Transport 27. Shri H. P. Sinha, Consulting Engineer (Roads Development) and Joint Secretary, Ministry of Transport & Communication, Department of Transport, New Delhi
- (ii) Department of Communication and Civil Aviation 28. Shri D. C. Das, Joint Secretary, Ministry of Transport and Communication, Department of Communication and Civil Aviation, New Delhi
- Department of Atomic Energy 29. Shri H. N. Sethna, Head, Chemical Engineering Division, Atomic Energy Establishment, Trombay, Apollo Pier Road, Bombay
- Planning Commission . . . 30. Dr. A. N. Khosla, Member (Education), Planning Commission, Yojana Bhavan, New Delhi
- Central Board of Irrigation and Power 31. Secretary, Central Board of Irrigation and Power, Curzon Road, New Delhi
- (f) Lok Sabha 32. Shri Ranbir Singh Chaudhury, M. P., Vill. & P. O. Sangli, Distt. Rohtak.
33. Shri N. Keshava, M.P., 44/1 Rangarao Road, Shankarpur, Basavangudi, Bangalore.

- (g) **Rajya Sabha** 34. Shri K. Santhanam, M.P.,
"Sundara", Rajaji Nagar
Pallavaram, Chingleput Dis-
trict, Madras
- (h) (i) *State Governments :*
- Government of Andhra Pra- 35. Shri C. V. D. Murthy, Director
desh of Technical Education, Andhra
Pradesh, Hyderabad
- Government of Assam . . . 36. Minister for Education, Assam,
Shillong
- Government of Bihar . . . 37. Deputy Minister, Industries,
Bihar, Patna (Shri L. P. Shahi)
- Government of Gujarat . . 38. Director of Technical Education,
Gujarat State, Ahmedabad
- Government of Jammu & 39. Principal, Kashmir Govern-
Kashmir ment Polytechnic, Srinagar
- Government of Kerala . . . 40. Dr. M. V. Kesava Rao, Director
of Technical Education, Kerala
State, Trivandrum
- Government of Maharashtra . 41. Shri T. N. Tolani, Director of
Technical Education, Bombay
- Government of Madhya Pra- 42. Minister for Education, Madhya
desh Pradesh, Bhopal
- Government of Madras . . . 43. Minister for Education, Madras,
or in his absence Secretary,
Education & Public Health
Department or Director of
Technical Education, Madras,
Madras
- Government of Mysore . . . 44. Minister for Education, Mysore,
Bangalore
- Government of Orissa . . . 45. Minister for Technical Educa-
tion, Orissa, Bhubaneswar
- Government of Punjab . . . 46. Minister for Public Works,
Panjab, Chandigarh or in his
absence Dy. Minister, Public
Works, Punjab, Chandigarh
- Government of Rajasthan . . 47. Shri V. G. Garde, Director
of Technical Education, Rajas-
than, Jaipur
- Government of Uttar Pradesh 48. Deputy Minister for Industries
Uttar Pradesh, Lucknow

Government of West Bengal . 49. Minister for Education, West Bengal, Calcutta or in his absence Secretary, Education Department, West Bengal Government, Calcutta

(ii) *Union Territories*—

Delhi 50. Director of Education, Delhi Administration, Delhi

Himachal Pradesh 51. Secretary (Education), Himachal Pradesh, Simla-4

Manipur 52. Shri S. D. Bahuguna, Director of Education and *Ex-Officio* Secretary, Education, Manipur Administration, Imphal

Tripura 53. Chief Commissioner, Tripura, Agartala

(i) Industry & Commerce :

Associated Chambers of Commerce of India. 54. Shri B. F. Goodchild, M/s. Saxby & Farmer (India)Ltd., 17, Convent Road, Entally, Calcutta

55. Shri Bharat Ram, C/o. Delhi Cloth & General Mills Co. Ltd., Delhi-6

All India Organisation of Industrial Employers. 56. Shri R. H. Modi, M/s Tata Iron & Steel Co. Ltd., 23-B, Netaji Subhas Road, Calcutta

57. Shri Kanchanlal C. Parikh, Ahmedabad Jupiter Spg. Wvg. & Manufacturing Co. Ltd., Dardhechi Road, P. B. No. 43, Ahmedabad

Employers Federation of India 58. Prof. G. M. Nabar, Director, Department of Chemical Technology, University of Bombay, Matunga, Bombay

59. Shri G. Y. Mangrulkar, Staff Training Officer, Tata Iron & Steel Co. Ltd., Jamshedpur

Federation of Indian Chambers of Commerce and Industry 60. Shri Sookamal Ghosh, M/s. Amrita Bazar Patrika Private Ltd., 14, Ananda Chatterji Lane, Calcutta

61. Prof. M. P. Gandhi, Jan Mansion
Sir Pheroze Shah Mehta Road,
Fort, Bombay
- (j) Labour :
- Indian National Trade Union Congress 62. Shri Michael John, M. P., 17,
K-Road, Jamshedpur
63. Shri Shantilal Shah, C/o Textile
Labour Association, Gandhi
Majoorsevalaya, Bhadra,
Ahmedabad
- All India Trade Union Congress 64. Prof. K. V. Subrahmanyam, 14,
Sriramnagar South, Madras-18
- Hind Mazdoor Sabha . . . 65. Shri Shanta Ram S. Tawade,
Secretary, Engineering Maz-
door Sabha, Kamgar Sadan,
Nawab Tank Road, Mazgaon,
Bombay-10
- (k) Central Advisory Board of Education 66. Dr. Mohan Sinha Mehta, Vice-
Chancellor, University of Rajas-
than, Jaipur
- (l) Inter University Board of India 67. Dr. A. L. Mudaliar, Vice-Chan-
cellor, Madras University,
Madras
- (m) National Institute of Sciences of India, Mathura Road, New
Delhi 68. Prof. R. C. Majumdar, Professor
of Physics, Delhi University,
Delhi
- (n) National Council for Rural Higher Education 69. Shri T. S. Avinashilingam, M.P.,
Director, Shri Ramakrishna
Mission Vidyalay Rural Insti-
tute, Coimbatore
- (o) Association of Principals of Technical Institutions (India) 70. Dr. T. Sen, Rector, Jadavpur
University, Calcutta-32
71. Shri G. R. Damodaran, Princi-
pal, P. S. G. College of Engi-
neering & Technology, Peel-
amedu, Coimbatore-4
- (p) Professional Bodies
- Institution of Engineers . 72. Maj. Gen. Harkirat Singh, Engi-
neer-in-Chief, Army Head-
quarters, New Delhi
- Indian Institute of Architects, Bombay 73. Shri H. N. Das, Meadows
House, Meadows Street, Fort,
Bombay-1

- (q) University Grants Commission 74. Chairman, University Grants Commission, New Delhi
75. Dr. B. D. Laroia, Development Officer (S & T), University Grants Commission, Old Mill Road, New Delhi
- (r) Nominees of Government of India 76. Shri S. K. Bose, Director, Indian Institute of Technology, Powai, Bombay-76
77. Shri M. Hayath, Technical Director, Heavy Electricals Ltd., 5, Parliament Street, New Delhi
- (s) National Productivity Council 78. Shri H. D. Shourie, Executive Director, National Productivity Council, 38, Golf Links, New Delhi-3

ANNEXURE II

(Item No. 4)

Proposals for establishment/development of technical institutions approved by the Co-ordinating Committee

1. Punjab Engineering College, Chandigarh		Introduction of degree course in Architecture
2. Polytechnic at Sirsa 3. Polytechnic at Batala 4. Polytechnic at Guru Trg Bahadur Garh. 5. Polytechnic at Jhajjar	}	Establishment
6. Madhav Engineering College, Gwalior 7. Shri Govindram Sakseria Tech- nological Institute, Indore.	}	Provision of facilities for high- voltage work
8. Polytechnic at Poona 9. Polytechnic at Ahmedabad	}	Additional Workshop Equipment
10. Tirhut School of Engineering, Muzaffarpur 11. Bhagalpur School of Engineering, Bhagalpur	}	Development of Institutions for Diploma Course in Engineering
12. Muzaffarpur Institute of Techno- logy, Muzaffarpur		Development of Institution for degree course in Engineering
13. College of Leather Technology, Calcutta		Development of Degree course in Leather Technology
14. Dum Dum 15. Barrackpore 16. Jadavpur 17. Sindri 18. Rourkela	}	Centres for the Sandwich Cour- ses in Mechanical Engineering.
19. College of Engineering and Tech- nology, Jadavpur University		Provision of facilities for the improvement of the Depart- ment of Chemical Engineering.
20. Polytechnic at Bidar 21. Polytechnic at Coorg	}	Establishment
22. Thiagarajar Polytechnic, Salem		Development of Diploma Course in Textile Technology.
23. S. J. Polytechnic, Bhadravathi		Development of Diploma Courses in Engineering subjects.
24. School of Architecture, University of Madras 25. Vuyyuru Polytechnic, Vuyyuru 26. Sri Venkateswara Government Polytechnic, Tirupathi	}	Development of facilities at the Technical Institutions
27. Annamalai University, Department of Engineering		Additional facilities for Engi- neering Departments to Uni- versities

ANNEXURE III

(Item No. 5)

Engineering Colleges/Polytechnics included in the States Plans

State	Engineering Colleges	Polytechnics
1. Andhra Pradesh	2—Waltair & Tirupathi (University Institution)	7—Tirupathi, Vizagapatnam, Warangal, Guntur, Mahaboobnagar, Nandyal and Nellore
2. Assam	2—Gauhati & Jorhat	1—Nowgong*
3. Bihar	..	2—Patna & Gaya
4. Gujarat	..	3—Dohad, Patan and Broach*
5. Jammu & Kashmir	..	2—Srinagar and Jammu
6. Kerala	1—Trichur	2—Trivandrum and Cannanore
7. Madhya Pradesh	1—Raipur	5—Jaora, Nowgong, Ujjain, Raigarh and Jabalpur
8. Madras	..	..
9. Mysore	..	8—Gulbarga, Karwar, Tumkur, Belgaum, Chickmagalur, Chcnapatna, Bidar and Coorg*.
10. Maharashtra	2—Aurangabad† and Karad)† shifted from Nagpur)	2—Sholapur & Karad
11. Orissa	1—Burla	1—Bhadrak.
12. Punjab	1—Patiala	2—Chandigarh and Jhajjar*
13. Rajasthan	..	3—Ajmer, Udaipur and Bikaner*

*Indicates institutions which have not started functioning so far.

State	Engineering Colleges	Polytechnics
14. U.P.	7—Bareilly, Jhansi, Chandauli, Handia, Khurja, Nainital and Hathras
15. West Bengal	4—Jhargram, Mur- shidabad, Purulia and Belghuria
16. Pondicherry	1—Pondicherry*
17. Tripura	1—Agartala
18. Himachal Pradesh	1—Sundernagar
	10	52 (46 plus 6*)

*Indicates institutions which have not started functioning so far.

ANNEXURE IV

(Item No. 5)

Junior Technical Schools included in the Second Five Year Plan

S. No.	State	No. of schools originally included in the Plan	No. of schools included in the revised Plan	No. of schools started so far
1.	Andhra Pradesh	..	3	3—Secunderabad ; Kakinada and Tirupati (Adjuncts to Polytechnics).
2.	Assam . . .	..	..	..
3.	Bihar . . .	6	2	Nil
4.	Gujarat . . .	..	..	..
5.	Jammu & Kashmir	..	..	..
6.	Kerala . . .	18	9	9—Attingal, Adoor, Shertallai, Pampadi, Perumbavoor, Kunnamkulam, Shoranur, Manjeri and Cheruvathoor
7.	Madhya Pradesh	13	7	5—Tikamgarh, Shahdol, Satna, Panna and Gwalior
8.	Madras . . .	Nil	3	2—Guindy and Madurai (Adjuncts to Polytechnics)
9.	Mysore . . .	..	..	..
10.	Maharashtra	..	..	..
11.	Orissa . . .	2	..	..
12.	Punjab . . .	6	3	3—Kapurthala, Kangra and Gurgaon
13.	Rajasthan . . .	4	Nil	Nil

S. No.	State	No. of schools originally included in the Plan	No. of schools included in the revised Plan	No. of schools started so far
14.	Uttar Pradesh	8	5	5—Jaunpur, Jhansi, Allahabad, Ghaziabad and Daurala
15.	West Bengal	9	11	11—Rahara, Kalanabagram, Laudoha, Basanti, Hooghly, Asansol, Jhargram, Krishnanagar, Durgi, Jalpaiguri & Kalimpong
16.	Pondicherry	Nil	1	Nil
17.	Manipur	..	1	Nil
TOTAL		66	45	38

ANNEXURE V

(Item No. 6.I)

Scheme of National Diploma Course in Applied Art

In 1950, the All India Council for Technical Education approved a scheme of courses in Applied Art and Crafts prepared by the All India Board of Technical studies in Applied Art. This scheme envisaged the following three levels of training :

- (1) Preparatory course of three years duration designated as the All India Intermediate in Art and Crafts.
- (2) Advanced training of two years duration designated as All India Diploma in any of the following :—
 - (a) *Fine Art Group* :
 - (i) Drawing and Painting,
 - (ii) Sculpture.
 - (b) *Applied Art Group* :
 - (i) Commercial Art,
 - (ii) Crafts.
- (3) Post-graduate course of one year designated as the All India Advanced Diploma in any of the following :—
 - (a) Fine Arts,
 - (b) Commercial Art,
 - (c) Crafts.

2. In 1958, the All India Board of Technical Studies in Applied Art considered *inter alia* the suggestion that the scheme of courses should lay more emphasis on the spirit of investigation, experimentation and incentive for original work than examination, and that the Intermediate course should be of two years duration instead of three years and the advanced course of three years duration instead of the present two years. The Board expressed the view that while it would not be desirable to modify the scheme all of a sudden, yet no course should remain static. It should be subject to constant review in the light of the new situations that arise and modifications should be made wherever necessary.

3. The Board appointed an Expert Committee to examine the syllabi *vis-a-vis* the foregoing suggestions and also to formulate the requirements of staff, accommodation, equipment and other physical facilities for conducting the courses. The Committee observed that at present there is no uniformity in the admission qualifications, duration and content of the courses, etc. in the existing art institutions in the country and that the courses should be re-organised and re-vitalised in the light of present needs and trends in the field of art education. The Committee expressed its considered opinion that for establishing oneself as a professional painter or sculptor or Commercial artist, three years of advanced instructions in the concerned subject would be absolutely necessary. The Committee was also of the view that the art institutions should not be fettered with rigid syllabi or courses of study as insistence on a rigid course might do harm

to art education. Art education should have some prescribed outline of the objectives to be achieved but the growth of an institution should be left to the individual professors and staff. The institutions should develop within the objectives prescribed their own detailed curricula according to local needs, creative ability of students and the staff available. There should be 960 working hours in a session and broadly 30-40% of total working hours should be devoted to lecture work and the remaining hours to practical work so that more emphasis is laid on practice than on theory. In the light of the foregoing, the Committee prepared a revised scheme.

Revised Scheme

4. The salient features of the revised scheme, as approved by the Applied Art Board, are given below :—

Courses of Study.—The National Diploma course in Applied Art & Crafts should be of five year's duration consisting of a two-year common Preparatory Course followed by a three-year Advanced Course in Painting or Sculpture or Applied Art. In the second year of the Preparatory Course, a student should have the opportunity to offer elective subjects according to his aptitude and ability. The three year Advanced Course should be in one of the following groups :—

- (a) Painting,
- (b) Sculpture,
- (c) Applied/Commercial Art.

The revised model syllabus for the courses is given hereafter at pages 194 to 199.

Entrance Qualifications.—The minimum admission qualification for the National Diploma courses should be Secondary School Leaving certificate. In exceptional cases the Board may relax this condition.

Enrolment of students.—An ideal art institution should have a strength of 120 students, which may, if necessary, be increased to 150. The annual intake may be taken as 30.

Staff.—The average number of students per teacher should not exceed 15. On this basis the staff required for an Art institution with ultimate student body of 150 together with salary scales for the teaching staff is given at pages 199-200. The qualifications of the teaching staff are given at pages 200-201.

For developing the art institutions on right lines, the right type of people should be selected as teachers. In order to do so, scales of pay of various staff should conform to the scales recommended by the All India Council for Technical Education for other technical colleges. Details of the staff are given at pages 199 and 200.

Accommodation.—For art education the question of space requirement is much more than in any other field of study in view of their peculiar requirements. An art student for painting as well as for sculpture needs more floor space than any other technical student. In addition to the floor space required by each student in studio and workshop, some space is needed for arranging the life models. Moreover, sufficient space should be provided between the model and the nearest students so that the student's observations and perspective might not be distorted. The total carpet area required for administrative buildings, class rooms, studios, etc. would be 52,950 sq. ft. out of which 14,900 sq. ft. would be the pucca structure and 38,050 sq. ft. workshop structure. Details of requirements for accommodation are given at pages 201-202.

Equipment.—The equipment that would be required for conducting the courses is listed at pages 202 to 206. The estimated cost of equipment will be of the order of Rs. 1.33 lakhs.

Library.—To start with, a sum of Rs. 10,000 should be provided for the library and its necessary equipment. The Library should be gradually developed and equipped with latest publications. For this purpose a separate annual recurring provision of Rs. 5,000 (Rs. 3,000 for books, Rs. 1,000 for specimens and re-prints and Rs. 1,000 for periodicals and journals) should be made.

Examination Scheme

- (i) There should be two public examinations—one at the end of the Preparatory Course and the other on completion of the Advanced Course.
- (ii) In examination, emphasis should be given more on practice than on theory and that the work done by a student during the session should also be assessed. 25% marks should be allotted to sessional work.
- (iii) For every paper there should be an internal and external examiner who may also review the assessment of sessional work.
- (iv) A candidate will be declared to have passed if he/she secures at least 35% marks in theory and 50% marks in each of the practicals and sessional work.
- (v) The successful candidates would be graded as follows according to the percentage of marks secured :

Distinction	.	.	80% or above.
First Division	.	.	60% or above but below 80%.
Second Division	.	.	50% or above but below 60%.
Third Division	.	.	Below 50% provided the student satisfies conditions laid down in (iv) above.

The detailed examination scheme is placed at pages 206 to 208.

Part-time courses.—The part-time National Diploma Course may be introduced wherever necessary. The duration of such a course should normally be 7 years. On the recommendation of the Heads of Institutions, the All India Board of Technical Studies in Applied Art may reduce the duration of the course if a student shows extraordinary ability and attains the required proficiency in shorter period. In no case the duration of the part-time course should be less than 5 years.

Estimates of Cost.—The estimates of cost for an art school conducting the revised five year National diploma course are given at pages 208 and 209. The break-up of the Non-recurring and Recurring expenditure will be as follows:—

<i>Non-Recurring</i> —	(Rs. in lakhs)
(i) Buildings	7.62
(ii) Equipment	1.33
(iii) Furniture	0.20
(iv) Library	0.10
TOTAL	9.25

<i>Recurring—</i>	(Rs. in lakhs)
(i) Staff	1. 8
(ii) Consumable Stores	0.07
(iii) Contingencies	0.05
(iv) Library—Periodicals & Journals	0.05
TOTAL .	1.97

National Courses in Arts & Crafts

PREPARATORY COURSE: (leading to Intermediate in Art) (Common to Painting, Sculpture and Applied Art)—*Duration—Two years.*

First Year

Objective	Exploration in basic studies, training in observation and in articulation.
Lecture Courses	Introduction to history of art and civilisation.
Studio Workshop Practice	(a) Study of objects and nature in relation to space, form and colour and their organisation in different mediums including Pen and Ink and Collage be used. Creative Design—Object Drawing, Elementary Modelling in relief and round.
	(b) Fundamentals of design and organisation to be studied simultaneously with the studio work.
	(c) Perspective and Lettering and rendering.
Crafts	(Any one choice) Wood-cut, Lino-cut, Pottery and Silk Screen.

Second Year

Objective	Formulation and Presentation.
Lecture Courses	History of Art and Civilisation.
Studio Workshop Practice	(a) Same as in the First Year in addition exercises in Oil, Tempera and Pastel Plaster and Cement.
	(b) Studies in Anatomy with emphasis on structure and balance.
Crafts	(Any one choice) Wood-cut, Lithography, Pottery and Silk Screen.

Advanced Course

(Post-Intermediate National Diploma)

I. Painting

Third Year

Objective	Organisation, individual pictorial vision, execution.
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- [Lecture Courses . . . History of Art and Civilisation.
 Technique Technical Studies of Water colour, Tempera and Oil.
 [Studio Workshop Practice Drawing and Painting from life with special emphasis on organisation, individual pictorial vision and functional aspects.
 Crafts (Any one choice) Wood-cut, Auto-lithography and Etching and Pottery.

Fourth Year

- Objective As in the Third Year.
 Lecture Courses Comparative studies of art and appreciation.
 Techniques Miniature, Mural—Methods and material.
 Studio Workshop Practice Drawing and painting with special emphasis on organisation, individual pictorial vision and functional aspects. Studio practice of creative painting and mural decoration with the same emphasis as above.

Fifth Year

- Objective Synthesis and final studies.
 Lecture Courses As in Fourth Year.
 Techniques Elementary principles and techniques of preservation and renovation.
 Studio Workshop Practice To continue as in Fourth Year with individual and collaborative projects.

II. Sculpture*Third year*

- Objectives Organisation, individual plastic vision, execution.
 Lecture Courses History of art and civilisation.
 Technique Study of building armature with wood, pipe and metal.
 Studio Workshop Practice Modelling and Carving from life with special-emphasis on organisation of form, individual plastic vision and functional aspects. Modelling from life.
 Crafts (Any one choice) Ceramics bronze Casting or Stone.

Fourth Year

- Objective As in the Third Year.
 Lecture Courses Comparative studies of art and appreciation,
 Technique Material and methods of Carving, Moulding Casting, metal shaping and welding, polishing and Patina.

Studio Workshop Practice Practice of Sculpture with special emphasis on organisation, individual plastic vision and functional aspects. Studio practice. Architectural sculpture in stone, bronze or wood.

Fifth Year

Objective Synthesis and final studies.

Lecture Courses As in the Fourth Year.

Techniques Experiments with various methods and materials.

Studio Workshop Practice Execution with one of the major materials like wood, stone or bronze.

III. Applied Art

Third Year

Subjects	Approximate No. of hours per session
<i>1. Drawing</i>	
(a) Sketching from life and nature	300
(b) Still life	
(c) Line and wash drawing.	
<i>2. Lettering</i>	
Principles of modern lettering, free hand style in lettering, functions, characters and families of types—types with serifs and sanserif.	220
<i>3. Press Layout</i>	
Purpose behind the layout appropriateness of a layout to the commodity advertised, types or categories of layout—symmetry, assymetry, dominance, isolation, repetition and radiation, balance continuity arrest-fullness, harmony in a layout.	220
<i>4. Poster Design</i>	
Types of poster design, development of idea, dramatising the display, symbolic values of colours, flat colours and half-tone effects.	220
TOTAL	960

Principal Subjects	No. of hours per session
1. <i>Drawing</i>	
(a) Sketching from life models	125
(b) Line and wash drawing.	
(c) Different rendering techniques (including scrapper boards etc.).	
2. <i>Lettering & Typography</i>	
Study of different type faces, principles governing the design and construction of typographical layouts for book work, display etc., study of factors governing legibility and attractiveness of printed matter setting and calculating copy matter for layout.	125
3. <i>Press Layout</i>	
Organising space taking into consideration the technical aspects of press ad., study of different techniques such as line and dot, scrapper board, air brush work, bleaching—photo-retouching, photomontage and ink work, wash drawing, dry brush work, use of mechanical screens etc. appropriateness of approach in designing press layout, psychological impact of press ad. design etc.	125
4. <i>Poster Design</i>	
Application of principles of poster, colour theory and colour symbolism, application to the subjects like show, cards, headings, counter displays, sign writing, psychological impact of poster design, illustration rendering in poster, simplicity and boldness in poster and its effect on the public.	125
5. <i>Cinema Slide</i>	
Designing cinema slide as a medium of advertisement, technical difference between other advertising design and cinema slide process of cinema slide and technical aspects of cinema slide.	100

Principal Subjects	No. of hours per session
Every student is expected to choose any two of the following seven syubsidary subjects:—	
1. Photography	360
2. Block-making	
3. Pithography	
4. Printing	
5. Packaging	
6. Book-Binding	
7. Interior Decoration.	
TOTAL	960

Fifth Year

Principal Subjects	No. of hours per session
<i>1. Illustration</i>	
Preparing illustration from a given story or copy matter, study of different techniques such as wash drawing, charcoal, pencil, crayon, scrapper board, etc., study from models for character and facial expressions, study of costumes, adaptation, colour rendering.	115
<i>2. Book-Jacket Designing</i>	
Suitability of approach, appropriateness of cover in relation with the matter of the book, colours and illustrations in Book-Jacket, attractiveness, Shelf appeal, economy in designing book-jacket.	75
<i>3. Press Layout</i>	
Approach to the subject, various appeals atmosphere in layout, rhythm and continuity study of different techniques of execution usual angles, imaginative drawing, use of symbolism and abstract ideas and their limitation, Layout campaign, use of screens.	100

Principal Subjects	No. of hours per session
4. <i>Poster Design</i>	
Study of commercial and educative posters, achieving maximum effect with implicity, boldness and economy of colours, Indian character in treatment and colour, atmosphere in poster, study in methods of reproduction, colour orchestration.	100
5. <i>Lettering and Typography</i>	
Study of different types of lettering, choice of types, suitability to the subject, sense of display, spacing, atmosphere in lettering finishing of artwork, specification of type faces, folder designing, level and packaging design.	100
6. <i>History of Art</i>	
Analysis of ancient, medieval and contemporary part with a bias towards the functional part of the Art forms (Illustrated).	60
7. <i>Lectures on Professional practice</i>	50
Subsidiary subjects chosen in the fourth year to be continued.	360
TOTAL	960

Staff

Designation	No. of posts	Scale of Pay
<i>A. Teaching Staff</i>		
Principal	1	Rs. 1300-60-1600-100-1800.
Heads of Departments (Professors)	3	Rs. 1000-50-1500.
Assistant Professors	3	Rs. 600-40-1000-50/2-1150
Lecturers	7	Rs. 350-350-380-380-30-590-EB-30-770-40-850 with a starting salary of Rs. 410 per month.
Demonstrator in Mural	1	Rs. 260-500.

Designation	No. of Posts
<i>B. Administrative Staff</i>	
Registrar	1
Clerks	2
Studio-Assistant	1
Librarian	1
Staff attendants	6
Peons	2
Watchman	2
Gardner	1
Sweeper	1

Qualifications of staff for conducting the National Diploma courses in Applied Art & Crafts

Sl. No.	Designation	Essential	Desirable	Age
1.	Professors	(i) A diploma in Art preferably in First class from a recognised institution or equivalent qualification. (ii) Seven years' professional or teaching experience in a responsible position/Professional in Applied or Commercial Art.	Original Design work in Applied or Commercial Art and Sculpture.	
2.	Assistant Professors	(i) A diploma in Art, preferably in First Class from a recognised institution or an equivalent qualification. (ii) Five years' teaching or professional experience in Commercial or Applied Art.	Experience or original design work in Commercial or Applied Art.	

Sl. No.	Designation	Essential	Desirable	Age
3.	Lecturers (Senior Scale).	(i) A diploma in Art, preferably in First Class from a recognised institution or an equivalent qualification.	..	Ordinarily not more than 40 years.
		(ii) Three years teaching or professional experience in Commercial or Applied Art.		
4.	Lecturers	Diploma in appropriate branch of Art from a recognised institution, awarded after completing the 5 years course of study with 3 years professional experience.		

List of Equipment and Accommodation for Conducting National Diploma Course in Applied Art and Crafts

Accommodation

1. Lecture Room (for 30-40 students)—4 2,400 sq. ft.
(600 sq. ft. each).
2. Studies :
 - A. Painting with north light and top light 5,000 sq. ft.
 - B. Additional space for 10 advanced students
@ 300 sq. ft. per student 3,000 sq. ft.
25% space for storage and lockers 2,000 sq. ft.
 - C. Sculpture @ 225 sq. ft. per student including
storage space (for 10 students) 2,250 sq. ft.
 - D. Applied Art @ 100 sq. ft. per student for
50 students 5,000 sq. ft.
Additional space for 10 advanced students
@ 300 sq. ft. per student 3,000 sq. ft.
25% space for storage and lockers 2,000 sq. ft.

3. Workshops :

A. Graphic Arts Lithography Etching Photography	6,000 sq. ft.
*B. Mural, Mosaic & Pottery and Ceramics	5,000 sq. ft.
*C. Bronze casting, Metal works (including store space)	800 sq. ft.
*Later phase.	

Administrative Buildings

1. Office—20 × 25 ft.	500 sq. ft.
2. Principal's Room	400 sq. ft.
3. Auditorium-cum-Exhibition Hall	3,000 sq. ft.
4. Library	2,500 sq. ft.
5. Staff room	600 sq. ft.
6. Common Room :	
A. Girls	1,500 sq. ft.
B. Boys	1,500 sq. ft.
7. Studies for teachers	2,000 sq. ft.
8. Canteen (120 students) Workshop structure	2,000 sq. ft.
9. Museum	2,500 sq. ft.

(Independent sanitary facilities to be provided for every workshop and studio if possible. Studios shall be workshop structures).

Equipments

SCULPTURE :

Preparatory Course (for 10 students)

	Nos.
1. Lockers 2' × 3'	10
2. Easel	10
3. Donkey	10
4. Relief Stand	10
5. Armature Stand 18"	10
6. Armature Stand 2'6"	10

Advanced Course (for 10 students)

Armature 18"	10
Armature 2'6"	10
Armature 5'	10
Turn Table for life study	10
Turn table for General work	10
Relief stand 2' × 4'	10

General Equipments (for 10 students)—

Rotating thrones for life study	3
Modelling tools	10 sets

	Nos.
Carpentary tools	2 sets
Working tables 2'6" × 4' × 2'	4
Wheel Barrow	1
Enamel basin	4
Sink	2
Clay tanks 3' × 5' × 2'6"	3
Partition Screens 8' × 8'	12
Tool cupboards 2' × 3' × 6'	1
Pedestal fans	4
Calipers	10
Black-boards	4
Two running shelves 18" deep along the wall .	

Painting :

Preparatory Course (for 30 students)

Easel	30
Donkey	30
Side Stools/Tables	30
Drawing board	30
Seat stools	30

Advanced Course

Easel	1 each
Drawing board	1 each
Donkey	1 each
Side stool	1 each
Pallette stool	1 each
Water bowl	1 each

General Equipments (Painting)

Caste-box (still life corners)	12
Life Models—revolving thrones 4' diameter .	4
Chair, Couch, Cushions etc.	2 each
Folding Screens for background 7' standing height.	
Geometrical instruments with—T-squares and Set-squares. (for blackboard lessons) . .	1 set
Stoves	2
Burner	1
Pans (Polythene)	6
Basins (Polythene)	6
Buckets (Polythene)	6
Blackboard 4' × 6'	4

	Nos.
Hand-tools kit	6 sets
Jugs (Polythene)	12
Cupboards for storing	12
Racks	6
Skeleton lay figure and properties	1
Polished sink for washing with four taps— 3' × 15'	1
<i>Mural</i>	
Adjustable ladder with platform 18' high	1
Limo pit 3' × 3' × 3'	1
Colour grinders (potmill)	1
Masonry tools	2 sets
Water hose	1
Buckets	4
Sink 3' × 15' with four taps	1
Alimarah (steels) 6' high	4
APPLIED ART	
<i>Advanced course for 30 students</i>	
Working tables 8' × 3'	4
Compressor	1
Air Brushes	1 set
Drawing boards 30" × 40"	12
Epidioscope	1
Pantograph	1
Table 20" × 30" with ground glass top and light box	1
<i>Graphics Advanced Course</i>	
Tables 3' × 6' with drawers	6
Work table with heavy top and tool box and drawers with vice fitted on top (size 8' × 3')	1
Printing table 8' × 3'	1
Black proof press with single roller with a stand having provision for storage of inks, papers etc. (size 15" × 20")	1
Carpentry Tools	1 set
Graining tools and wood cut tools	1 set each.
Box for wetting papers 20" × 30" × 6"	1
<i>Lithography</i>	
Hand-proofing press 15" × 20", 20" × 30"	2
Lithographic polishing & grinding stones	1 set

Plate graining machine 20" × 30"	1
Work tables 6' × 3'	6
Dusting box	1
Table for graining and polishing stones. 6' × 3'	1
<i>Photography</i>	
One Studio Camera	1
Enlarger	1
Dark room equipment . . . . .	..
<i>Bronze casting</i>	
Over-head Girder. Crane with chain pulleys to cover the area 20' × 30' (half ton capacity) .	1
Working tables with a vice of 20" span . . .	1
Pit furnaces for smelting 200 lbs., 150 lbs. and 75 lbs. of metal (gun metal)	3
Baking Chamber 4' × 5'	1
Foundry Floor of sand . . . . .	..
Blower with a 3 H.P. motor with connecting pipe to the furnaces (size 18")	1
Anvil	1
Crucibles for 200, 150 & 75 lbs.	3
Tongs & frames for individual crucibles . . .	3
Finishing tools and metal chisels, Hacksaws . .	1 set
Metal Hammer	2
Shovel	1
Crowbars	2
Cupboards for Chemicals	1
Cupboard for tools	1
Gas welding	1 set
Tables 2'6" × 3' × 2'6"	4
Stove	1
Blow-lamp	1
Heavy weighing scale	1
Fuel tanks (6' × 5' × 3')	3
<i>Stone Carving</i>	
Jip Crane (for lifting)	1
Stone Carving stands 3' × 3' × 2'	5
Donkeys	5
Flexible lights	4
Pedestal fans	2
Pointing compass for portraits and life sizes .	2

	Nos.
Chisels	1 set
Emery grinder with motor	1
<i>Ceramics & Pottery</i>	
Throwing wheels (kick wheel)	5
Pot mill 3' x 18"	1
Ball Mill (20 lbs. capacity)	1
Filter presa with blungers	1
Down druffed kiln	1
Electric kiln with pyrometer (1200 C)	1
Physical balance	1
Wooden troughs with lids 2" diameter 3" deep	6
Polythene Bowls	4
Mesh Strainers	4
Sinks	2
Racks for storing Pottery.	

General Equipment

Slide Projectors for visual aid equipment	3
Plastic casts for Art History	
(Other Miscellaneous equipments including photographic slides etc.).	

Scheme of Examination

Subject	Duration of Examination	Marks
PREPARATORY COURSE (AT THE END OF SECOND YEAR)		
<i>Theory</i>		
I. History of Art and Civilisation	3 hours (one day)	100
<i>Practice</i>		
II. (a) Still Life	13 hours (spread over 3 days).	} 100
(b) Drawing from life	6 hours (one day)	
(c) Composition	18 hours (spread over 3 days).	
III. (a) Modelling in round	18 hours (spread over 3 days).	} 100
(b) Modelling in relief	18 hours (spread over 3 days).	
IV. Lay-out and Lettering	9 hours (spread over 2 days).	100

Subject	Duration of Examination	Marks
<i>Sessional Work</i>		
Craft work done during the last term to be submitted for assessment.		100
	TOTAL	500

NATIONAL DIPLOMA (AT THE END OF FIFTH YEAR)

GROUP : *Painting*

Theory

I. Art Appreciation 3 hours (one day) 100

Practice

II. Life Study 5 days of 4½ hours each. 100

III. Composition. 6 days of 6 hours each. 100

Sessional work

Special assignment done in the last term in one of the following subjects to be submitted for assessment Mural, Miniature or Graphic Art. 100

TOTAL 400

GROUP : *Sculpture*

Theory

I. Art Appreciation 3 hours (1 day) 100

Practice

II. *Life Study*—
(Full size life study) of approximately 4 ft. 42 hours (7 days) 100

III. *Composition*—
(Composition in clay for any of the three materials. 42 hours (7 days) 100

Sessional Work

One assignment in any of the Crafts such as wood, stone, or Bronze to be submitted for assessment, 100

TOTAL 400

Subject	Duration of Examination	Marks
GROUP : Applied Art		
<i>Theory</i>		
I. Art Appreciation	3 hours (1 day)	100
<i>Practice</i>		
II. Paper on any one of the following :		
(a) Poster	} 13½ hours (3 days)	100
(b) Lettering		
(c) Press lay-out		
(d) Illustration		
III. Visualisation and Space Organisation.	4½ hours (1 day)	100
<i>Sessional work</i>		
One special assignment done during the last term (other than the subject of specialisation) to be submitted for assessment		100
TOTAL		400

Estimates of cost for a typical art institution with ultimate student body of 150²

Non-recurring Expenditure

1. <i>Buildings</i>		
(a) Administrative Buildings, Lecture rooms, etc. (Pucca structure)	14,900 sq. ft.	
42% plinth	6,258 sq. ft.	
TOTAL		21,158 sq. ft.
@Rs. 14.40 per sq. ft.		Rs. 3.05 lakhs.
(b) Studios, Canteen etc. (Workshop structure)	38,050 sq. ft.	
20% Plinth	7,610 sq. ft.	
@Rs. 10 per sq. ft.		Rs. 4.57 lakhs.
2. Equipments		Rs. 1.33 lakhs.
3. Library		Rs. 0.10 lakhs

Recurring Expenditure (Ultimate)

1. <i>Staff salaries—</i>		
(a) Administrative		Rs. 30,540
(b) Teaching		Rs. 1,50,060
TOTAL		Rs. 1,80,600

2	Consumable Goods	Rs. 7,000
3	Contingencies (including models & Study tours) (Models Rs. 2,500, study tours 2,000) .	Rs. 4,500
4	<i>Library—</i>	
	(a) Books for Library	Rs. 3,000
	(b) Specimens & Reprints.	Rs. 1,000
	(c) Periodicals & Journals	Rs. 1,000
	TOTAL .	<u>Rs. 5,000</u>

ANNEXURE VI

(Item No. 10)

Administrative Staff College, Hyderabad

In 1948 the All India Council for Technical Education appointed an Expert Committee to examine the question of education and training in Industrial Administration and Business Management in its various aspects and to draw up a scheme of management studies for implementation. The Committee in its report submitted in 1953 recommended *inter-alia* that an Administrative Staff College should be established in the country on the same lines as at the well known Administrative Staff College at Henley on Thames, England. The recommendation was approved by the All India Council for Technical Education and the Minister in his capacity as Chairman of the Council appointed in 1953 a Planning Committee under the Chairmanship of Shri T. T. Krishnamachari, the then Minister of Commerce & Industry, to prepare detailed plans and estimates for the Staff College and to take all necessary steps for its early establishment. The Committee in its report submitted in 1956 recommended that the College should be established at Hyderabad as joint and co-operative enterprise of the Central Government, Industry, Commerce and general public. It also recommended that the college should function as a registered society with a Court of Governors for the administration and management of its affairs and finances.

The recommendations of the Planning Committee were accepted and the College was registered as a Society in 1956. A Court of Governors under the Chairmanship of the late Dr. John Mathai and consisting of leaders of industry, commerce, education, labour, etc. and a representative of the Central Government was set up. Through the courtesy of the Government of Andhra Pradesh a spacious building at a concessional rate of rent was acquired and the college started functioning in 1957 with General Shrinagesh as its first Principal.

The Government of India approved the following estimates towards the cost of establishment and maintenance of the College :—

(i) *Non-recurring* :

1. Building (additions and alterations to Bella Vista)	3·0 lakhs
2. Equipment including furniture, library etc.)	4·0 lakhs
TOTAL	7·0 lakhs

(ii) *Recurring* 6·2 lakhs per annum (maximum).

(iii) *Construction of staff quarters* 9·0 lakhs

The Central Government agreed to meet the entire non-recurring expenditure. As regards recurring expenditure the Government agreed to give a block grant of Rs. 3·0 lakhs every year for the first three

years; the balance of Rs. 3·20 lakhs being met out of the contributions received from industry and commerce and income from tuition fees. The Government also agreed to give an interest-free loan not exceeding Rs. 9·0 lakhs for the construction of staff quarters.

The Central Government have already paid to the College the entire non-recurring grant, block recurring grants in full for the first three years and loan for staff quarters, as indicated above.

In addition, the College has been granted a sum of Rs. 2,87,000 (equivalent to Rs. 60,000 dollars) by the Ford Foundation for utilisation over a period of five years for the following specific purposes :—

	Rs.
(i) Accession to library	30,000
(ii) Freeships	87,000
(iii) Strengthening of staff	1,70,000
TOTAL	2,87,000

The Government of India have since decided to continue the payment of the recurring grant to the College for a further period of three years commencing from the year 1960-61 at the rate of Rs. 2·5 lakhs per year with the condition that the College will effect the necessary economies so that it may be able to stand on its own feet by the end of 1962-63. An amount of Rs. 2·50 lakhs was accordingly sanctioned in 1960-61.

The College is an autonomous organisation and functions as a Registered Society. The membership of the Society consists of:—

(i) *Patrons*.—Individuals or organisations who covenant to donate to the College a minimum sum of Rs. 20,000 each year for at least 5 years. Patrons are entitled to sponsor any number of candidates for the sessions of the College every year so long as the membership continues.

(ii) *Ordinary Members*.—Individuals or organizations who covenant to subscribe to the College a minimum sum of Rs. 2,000 each year for at least 5 years. Ordinary members are entitled to sponsor any number of candidates for the sessions of the College every year so long as the membership continues.

(iii) *Associate Members*.—Organisations subscribing a sum of Rs. 600 to the College are enrolled as Associate Members of the official year in which they are admitted. Associate Members may sponsor not more than one candidate per year for admission to the sessions of the College. Associate Members are also entitled to be present at the meeting of the General Body, if any, held during the term of their membership, but they are not eligible to vote at such meetings.

(iv) *Honorary Members*.—Persons eminent in public life and interested in the furtherance of the objects of the College and who are invited by the Court of Governors become Honorary members.

The administration and management of the affairs of the Society are entrusted to a Court of Governors, consisting of :—

- (i) Fifteen persons elected by the General Body,
- (ii) A person nominated by the Government of India,

- (iii) The Principal of the College (*ex-officio*), and
 (iv) Not more than 9 persons co-opted by the Court of Governors.

The following gives the category and number of members upto 1960-61.

Category of Members	1957-58	1958-59	1959-60	1960-61
Patrons	7	8	11	11
Ordinary Members	39	64	84	104
Associate Members	2	48	53	47

The Court of Governors has decided that the contributions from patrons should be utilised for raising a 'Building Fund' with the object of constructing a building for the college in place of the one which is rented. The annual income on account of subscriptions from the patrons is of the order of Rs. 2'00 lakhs.

Scope of the College.—The College seeks to bring together experienced executives of proved administrative capacity and give them an opportunity of examining different administrative practices in order to prepare them for still higher responsibilities in future. With the increasing complexity of administration whether in Government or industry, it is felt that those who would be entrusted with top management should have an opportunity of discussing their problems with others having different but comparable experience, and training to the end that an awareness and thinking on the objectives of their own work and the methods which they have been following may be created. The College believes that by bringing together men and women from different walks of life such as private industry, commerce and public service, it would facilitate the maximum interchange of ideas and experiences and thereby enrich the personalities of the participants leading to greater administrative efficiency in individual enterprises and higher productivity at the national level.

Duration of the Course.—The duration of the course is three months and three sessions are conducted during each year. The following gives the number of executives trained for the last nine sessions conducted by the College.

SESSIONS

I	II	III	IV	V	VI	VII	VIII	IX	Total
30	36	37	42	43	50	49	55	50	392

Each course can take in 50 members who will be so selected that they will constitute a cross-section of the working life of the country. They will be drawn from such different fields as :—

Industry, Commerce, Trade Unions, Education, Scientific Research, Social & Community Welfare, Local Government, Central or State Governments, Distribution, Housing, Communications, Transport, Agriculture, Health Services, Defence etc.

The aim is to secure for each course a fruitful mixture of varied experience, *viz.*, in Industry, Production or a closely related technique, Finance and Accountancy, General Administration including personnel work, Civil Services, Fighting Services, Education and other forms of social welfare work, Local Government, Trade Union etc.

Admission and Fees.—All candidates for admission are nominated by organisations, which are members of the College. Men and Women are equally eligible. Candidates should normally be between 35 and 45 years of age. The fee for the course is Rs. 2,400 per session member ; this covers the boarding and lodging expenses, essential books and materials, training expenses and a short tour to various places to study the working of Central ministries and departments of State Governments, large scale industries, development projects etc.

ANNEXURE VII

(Item No. 11)

Report of the Specialist Committee of the Architecture Board regarding expansion of training facilities in Town and Country Planning

The All India Board of Technical Studies, at its meeting held on the 4th November, 1957, considered the question of the expansion of facilities for Town and Regional Planning and observed that there was a need for organising a network of facilities in this field, but this should be done only in such places where there are already existing facilities for Architectural Education, Engineering Education and Departments of Economics and Sociology. It should also be ensured that a sufficient number of Town Planners are available in these places to participate in instructional work. There should be an adequate number of students interested in undergoing a training course in the subject. The Board appointed a committee with the following members to suggest places where Departments of Town and Country Planning for the training of Town Planners may be established keeping in view the aforesaid considerations.

1. Shri S. H. Parelkar *Chairman of the Board.*
2. Shri T. J. Manickam
3. Shri S. K. Joglekar
4. Shri C. S. Chandrasekhar

Proposals for starting a course in Town and Country Planning were invited from the State Governments, Universities and institutions where facilities for Architectural Education already exist and otherwise generally fulfilling the conditions laid down by the Board. A summary of the replies received may be seen at *Appendix I*. The existing facilities available in the country may be seen in *Appendix II*.

The Committee held two meetings. At its first meeting held on 4th January, 1960, it considered the facilities for Town Planning education then existing in the country and observed that the facilities available in the School of Town and Country Planning, New Delhi were not fully utilised, as the admissions till the year 1959 were far short of the approved intake. It further noted that the Chairman of the Central Rural and Urban Planning Organisation had urged the expansion of facilities for training personnel in Town Planning as there was a great dearth of such technical personnel. The Committee therefore decided that the Central Rural and Urban Planning Organisation may be requested to furnish full information of the requirements of Town Planning personnel for the 3rd Plan to enable them to consider the matter further.

The detailed information furnished by the Central Rural and Urban Planning Organisation was considered at the meeting of the Committee held on the 16th August, 1960.

The Committee observed that in the Third Five Year Plan it has been proposed to take up master plans for all class I, II and III cities and towns in India. About 550 towns will therefore need to be planned and plans will have to be also implemented. For this, town planning personnel will be required both at the State and at the local level. At the State level it is estimated that at least 7 qualified town planners would be required by each State and for bigger States this number may have to be proportionately increased. Income of the State by virtue of the large area covered they might have to create regional offices as has been done in Bombay, Hyderabad and Assam. This regional offices would again require at least two qualified people. About 30 regional offices may be set up in the III Plan period. In the case of local planning, authorities would be set up in the first half of the Third Plan. The total number of qualified town planners required can be summarised on the above basis as below :

For State Planning Bodies	$16 \times 7 = 112$
For Regional Offices	$30 \times 2 = 60$
For Local Planning Bodies	$100 \times 3 = 300$
TOTAL	472

To the above we can add 20 to 25 practising town planners required for the country. This number will be small in the beginning in view of the fact that the planning profession is yet to be established and most planning work would be done by the State Planning bodies or local planning authorities. The number of consultants will, however, increase as planning work grows and the need for consultants of experience becomes felt. We may, therefore, assume that we will need in all 500 town planners in all to staff the various State planning bodies, local and regional planning and in profession in the country.

At present there are about 55 qualified town planners including those who are in teaching institutions. Among these 55 town planners, a large number are doing work as architects and actual number of planners in the planning field does not exceed 40—45. Amongst these only about 10 have taken up private practice.

The shortage of town planners will therefore work out to about 450 and while this shortage cannot be made up immediately, steps should be taken to increase the training facilities in the country so that over a period of 2 to 3 years a substantial number of this shortage is made up and by the end of Third Five Year Plan the shortage is fully made up.

The training facilities to-day available are at three places, namely, the Delhi School of Planning and Architecture, Indian Institute of Technology, Kharagpur and Bengal Engineering College, Sibpur. The first two qualifications are recognised and the last qualification is not yet recognised by the Institute of Town Planners, India. The Delhi School of Architecture has an intake capacity of 25 per year and the Kharagpur intake 8 per year. The Bengal Engineering College has an intake capacity of 10 against which 7 to 8 students are admitted every year. Earlier there has been a paucity of suitable applicants for admission to the Delhi School, but this year the position has improved considerably and the indications are that in the not distant future the approved intake capacity of 25 will be inadequate to accommodate all eligible and suitable candidates seeking admission to the course.

The Committee recommended the following steps to be taken to train additional number of town planners required for the implementation of the Third Plan :—

- (1) The present course in the Bengal Engineering College should be re-organised as a full-time course with an intake of 20 to come up to standards laid down by the Institute of Town Planners (India).
- (2) A course in Town Planning should be started in (a) J. J. College of Architecture, (b) Department of Architecture, University of Madras, with an intake of 20 in each institution.
- (3) If the demand for town Planners justifies it, the Delhi School of Planning and Architecture should start a part-time course.

It may be mentioned in this context that training in urban and regional planning is at a post-graduate level and meant specially for engineers and architects and people trained in Sociology, Economics, Geography or Political Science can also avail themselves of this opportunity if they have completed their Master's degrees. It means that a person can avail of training in town and country planning only after he has spent 4 to 5 years in the University or a technical institution. At this stage many people would be reluctant to undertake a full-time study and would prefer getting trained on a part-time basis. Similar situation exists in some of the Western Countries. For example, the London University course in town and country planning was run between the hours of 6 to 10 in the evening and the New School of Planning in New York is to run a similar course from 6 to 9.30. It is practically feasible to run such a part-time course for training town and country planners and this may attract a larger number of students than a full-time course.

The Committee also examined the suitability of other centres for starting courses in town planning. The Committee recommended that if at a later stage it is found that facilities for the training of town planners will have to be augmented, the course may be instituted in the Hyderabad Centre and at Baroda. The Committee also recommend that candidates seeking admission to the full-time course in town planning should have the following qualifications :—

- (i) Degree or Diploma in Architecture, equivalent to the National Diploma in Architecture of the All India Council for Technical Education ; or
- (ii) Degree in Civil Engineering of a recognised University or completion of parts A and B of A. M. I. E., or
- (iii) Second Class Master's Degree in Geography, Sociology, Economics or Law.

The Committee suggests that the question of duration of the part-time course may be referred to the Syllabus Committee of the Board of Studies in Architecture & Regional Planning.

APPENDIX I TO ANNEXURE VII

Summary of replies received from the State Governments and Universities in respect of expansion of training facilities in Town and Country Planning

1. *Government of Bombay*.—College of Architecture of Sir J. J. School of Art would be in a position to provide training facilities in Town & Country Planning.

2. *Government of West Bengal.*—The Government of West Bengal has stated that a part-time post-graduate diploma course in Town & Country Planning is already being conducted by the Bengal Engineering College, Sibpur. Engineering and Architecture subjects are taught with the help of the respective Departments of the college while Sociology and Economics are taught by a visiting lecturer from the Calcutta University.

The Course is recognised by the Calcutta University and partially by the Institute of Town & Country Planning.

It is also proposed to start a Master's degree course in Town & Regional Planning.

Bengal Engineering College, Sibpur, satisfies the criteria laid down by the Board and therefore any assistance from Central Government to expand training facilities in Town & Country Planning will be appreciated.

3. *Government of Madras.*—It is desirable to start a course in Town and Country Planning in Madras. A detailed report with the name of institution where the course can be instituted will be sent shortly.

4. *University of Baroda.*—The University has adequate facilities for education in Engineering & Architecture. The Department of Economics and Sociology have also been associated for teaching the respective subject to the students of Engineering and Architecture. The subject of Town and Country Planning is already being taught as one of the subjects under their five year diploma course in Architecture. Necessary staff for instruction work is also available.

The Faculty of Technology & Engineering of the University which satisfies the criteria laid down by the Board may therefore be considered as a suitable institution for the expansion of training facilities in Town and Country Planning.

5. *University of Bombay.*—College of Architecture of Sir J. J. School of Architecture, Bombay would be in a position to provide training facilities in Town & Country Planning.

6. *University of Madras.*—It is proposed to establish Regional Institution for providing training facilities in Town & Country Planning in the University. It has been suggested to introduce degree course of 2 years' duration with 6 months' practical training with Architecture, B. E. or equivalent qualification as admission qualifications. Details with regard to the staff, accommodation and expenditure involved have also been worked out as indicated below :—

<i>I. Non-recurring</i>	Rs.
Buildings—About 7,500 sq. ft. including corridors etc. at Rs. 20	1,50,000
Fittings at 20% of the above	30,000
	<hr/>
	1,80,000
Furniture	16,000
Equipment	15,000
	<hr/>
Total Non-recurring expenditure.	2,10,000

II. Recurring

	Minimum Rs.	Maximum Rs.
Professor Rs. 800—1,250	9,600	15,000
Reader Rs. 500—800	6,000	9,600
Lecturer Rs. 250—500	3,000	6,000
Studio Assistants (2) Rs. 250—500	6,000	12,000
Visiting Lecturers (4) at Rs. 200	9,600	9,600
	<hr/> 34,200	<hr/> 52,200
Provident Fund, Leave allowance Dearness allowance etc.	10,260	15,660
	<hr/> 44,460	<hr/> 67,860
Consumables	8,000	8,000
Library	2,000	2,000
Excursion—Travelling allowance	1,000	1,000
	<hr/> 55,460	<hr/> 78,860
Average total recurring expenditure	Rs. 67,160	
	or	
	67,000	

6. *University of Calcutta.*—The Calcutta University has stated that there are facilities for training in the theoretical aspects of Central and Regional Planning in the Department of Economics but the Department lacks the technical staff for imparting necessary training in this subject. If the necessary staff is provided by the Board, the present training facilities can be considerably expanded.

APPENDIX II

Statement Giving Details of Town & Regional Planning Course

Sl. No.	Name of the Institution	Designation of the award and awarded by	Minimum admission qualifications	Duration of the course	Intake capacity	Remarks
1.	Indian Institute of Technology, Kharagpur. (Central Government).	M. Tech. in Architecture & Regional Planning by Board of Governors.	B. Tech.	1 year	8	
2.	Bengal Engineering College, Sibpur (State Government).	Post-graduate Dip. in Town & Regional Planning by Calcutta University.	B. E. Degree (in Civil Engg. or Architecture Engineering).	2 years	10	(Civil Engg. and Architectural Graduates may take two years' course in Town and Regional Planning as the 5th and 6th year of regular course, omitting the 5th year for Architects and the year of practical training for Civil Engineers).
3.	School of Town & Country Planning, New Delhi. (Central Government).	Diploma in Town & Country Planning by Board of Governors.	(a) Degree or Diploma in Architecture equivalent to N. Dip in Architecture of All India Council for Technical Education, or (b) Degree in Civil Engg. or (c) Master's Degree in Geography, Sociology, Economics or Law.	2 years	25	

ANNEXURE VIII

(Item No. 13)

Statement showing failures in the first year examination of engineering/technological courses

Name of the Institution	Year in which the Examination was held	No. of candidates appeared in the 1st year examination	No. of candidates failed in first year examination in		
			1st attempt	2nd attempt	3rd attempt
1	2	3	4	5	6
1. Government Textile Institute, Kanpur	1959	22	1	..	..
	1960	22	2	..	..
2. Faculty of Technology & Engineering, M. S. University of Baroda.	1955-56	28	4	2	..
	Civil Engineering.				
	Mechanical Engineering.	31	7	..	..
	Electrical Engineering.	32	8	..	1
	Textile Engineering.	28	7	6	..
	Textile Technology.	10	7	..	..
	1956-57	34	9	2	1
	Civil Engineering.				
	Mechanical Engineering.	33	9	1	..
	Electrical Engineering.	35	9	3	..
	Textile Engineering.	24	9	2	2
	Textile Technology.	15	6	3	..
	1957-58	112	32	..	..
	Civil Engineering.				
Mechanical Engineering.	60					9	..	..
Electrical Engineering.	56	17	..	..

1	2	3	4	5	6	
	Textile Engineering.	14	8	..	..
	Textile Technology.	8	5	..	..
	1958-59					
	Civil Engineering	147	39	17	..	
	Mechanical Engineering.	77	15	5	..	
	Electrical Engineering.	77	15	7	..	
	Textile Engineering.	21	6	4	..	
	Textile Technology.	17	6	1	..	
3.	Indian Institute of Technology, Madras.	1960	119	12	This is the 1st examination and so the question of 2nd or more attempt does not arise.	
4.	Guru Nanak Engineering College, Ludhiana.	1957	45	18	6	..
		1958	111	23	8	..
		1959	127	18	5	..
		1960	113	27	Information not available.	
5.	Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar.	1956	174	65	12	4
		1957	215	41	6	2
		1958	248	78	2	1
		1959	210	31	..	..
		1960	341	60	5	..
6.	Govindram Seksaria Technological Institute, Indore.	1956 (National Diploma Course).	59	14	1	..
		1957 (B.Sc. Engg.)	60	46	..	..
		1958	128	52	9	..
		1959	165	71	23	1
		1960	183	73	30	1

1	2	3	4	5	6
7. Department of Chemical Technology (University, of Bombay).	1956 1957 1958 1959 1960	22 24 22 57 68	3 2 3 11 11	.. 1 2	..........
8. Walchand College of Engineering, Sangli.	1956 1957 1958 1959 1960	244 187 192 189 189	42 42 58 34 30	.. 16 12 20 6	.. .. 5 8 8
9. College of Engineering, Guindy, Madras.	1960	274	121	(Information not available).	
10. Regional Engineering College, Warangal.	1960	240	120	..	..
11. Indian School of Mines & Applied Geology, Dhanbad.	1956 1957 1958 1959 1960	45 94 137 140 132	.. 1 6 7 7	.. .. 1 .. 2	..........
12. Victoria Jubilee Technical Institute, Bombay.	1956 1957 1958 1959 1960	168 185 189 211 211	52 61 87 83 122	1 3 13 11 23	1 2 5 6 14
13. College of Engineering, Bangalore.	1956 1957 1958 1959 1960	167 186 219 209 250	32 42 55 68 91	..........	..........
14. Government College of Technology, Coimbatore.	1956 1957 1958 1959 1960	75 87 118 119 118	46 46 77 42 44	15 8 26 11 (Information not available).	8 2 14 5 ..
15. Sri Venkateswara University, Tripati.	1960	119	54	..	..
16. Bihar College of Engineering, Patna.	1956 1957 1958 1959 1960	69 100 141 127 112	10 10 3 1 4	1 2 1 .. (Information not available).	.. .. .. .. ..

1	2	3	4	5	6
17. College of Engineering, Kakinada.	1956	109	69	33	13
	1957	110	59	40	10
	1958	124	72	28	19
	1959	151	94	41	20
	1960	149	88	(Information not available).	
18. Coimbatore Institute of Technology, Coimbatore.	April, '57	98	54	..	..
	Sept., '57	54	..	25	..
	March, '58	144	56	..	11
	Sept., '58	66	..	22	4
	March, '59	146	60	..	14
	Sept., '59	74	..	24	7
March, '60	157	49	..	12	
19. A. C. College of Engi- neering & Technology, Karaikudi.	1960	118	41	(Information not available).	
20. Musliar College of En- gineering, Quilon.	1959	118	7	..	..
	1960	119	4	..	..
21. Engineering College, Dayalbagh.	1956	64	9	..	..
	1957	65	3	..	..
	1958	63	12	1	..
	1959	64	26	1	..
	1960	66	25	..	..
22. Engineering College, Banaras Hindu Univer- sity, Varanasi.	1956	142	20	..	..
	1957	141	19	2	..
	1958	235	44	1	..
	1959	216	63	..	..
	1960	230	36	..	..
23. College of Mining & Metallurgy, Banaras Hindu University, Va- ranasi.	1956	58	9	..	..
	1957	74	15	..	..
	1958	92	10	..	..
	1959	84	16	..	..
	1960	100	11	..	..
24. Institute of Radio Phy- sics & Electronics, Cal- cutta.	1955	27	3	..	..
	1956	20	3	2	..
	1957	20	5	..	..
	1958	23	..	2	..
	1959	19	2	..	..
25. Thapar Institute of En- gineering & Technology, College of Engineering, Patiala.	1957	101	60	12	..
	1958	133	21	7	..
	1959	123	21	3	1
	1960	125	30	(Information not received).	

1	2	3	4	5	6
26. L. D. College of Engineering, Ahmedabad.	1956	181	95	9	..
	1957	244	57	9	2
	1958	369	156	6	5
	1959	439	171	28	2
	1960	511	100	55	18
27. Punjab Engineering College, Chandigarh.	April, '56	56	4	..	..
	Sept., '56	10	..	..	..
	June, '57	110	8	..	..
	Oct., '57	29	..	3	..
	April, '58	130	44	..	..
	Aug., '58	54	..	15	..
	April, '59	231	50	..	1
	Sept., '59	94	..	17	1
	April, '60	237	32	..	10
Sept., '60	67				(Information not available).
28. Engineering College, Muslim University, Aligarh.	1956	106	14	9	..
	1957	112	7	..	..
	1958	125	20	..	..
	1959	139	26	9	1
	1960	153	17	1	1
29. Regional Engineering College, Nagpur.	1957	66	34	11	3
	1958	60	37	15	6
	1959	60	21	8	3
	1960	60	25	..	..
30. Birla College of Engineering, Pilani.	1956	165	46	11	1
	1957	171	14	15	7
	1958	139	25	5	4
	1959	226	36	4	5
	1960	234	42	4	4
31. Annamalai University, Annamalanagar.	1956	67	4	..	..
	1957	116	6	1	..
	1958	126	8	..	..
	1959	125	7	..	..
	1960	127	2	..	..
32. Muzaffar Institute of Technology, Muzaffargarh.	1955	54	..	..	..
	1956	59	..	..	..
	1957	59	..	..	..
	1958	63	5	..	..
	1959	60	16	..	..
	1960	70	11	11	..
33. Thiagarajar College of Engineering, Madurai.	1958	50	19	..	..
	1959	119	20	..	..
	1960	118	60	..	..

1	2	3	4	5	6
34. P. S. G. College of Technology, Coimbatore.	1956 1957 1958 1959 1960	99 99 110 119 119	44 40 8 27 32	12 11 2 5 ..	5 3 1 1 ..
35. College of Engineering, Usmania University, Hyderabad.	1955 1956 1957 1958 1959	135 257 307 412 462	15 27 61 69 82	9 17 9 23 30	8 14 17 22 27
36. Ramgarhia Polytechnic, Phagwara.	1956 1957 1958 1959 1960	152 145 161 173 183	18 .. 6 28 24	1 .. 2 32 36	1 .. 2
37. St. Xavier's College Technical Institute, Bombay.	1956 1957 1958 1959 1960	28 42 36 39 39	6 14 10 12 10	3 1 7 4 1	.. .. .. 1 ..
38. Government Polytechnic, Dohad.	1960	56	39	(First Examination conducted in 1960).	
39. Technical Institute, Poona.	1956 1957 1958 1959 1960	12 11 6 14 15	7 2 1 7 2	1 4 1 1 1	..........
40. C. N. T. Institute, Madras.	April, 1956 April, 1957 April, 1958 April, 1959 Oct., 1959 April, 1960	126 148 130 132 16 136	24 42 23 27 .. 29	.. .. .. .. 10 ..	.. .. .. .. .. 3
41. Government Polytechnic, Channapatna.	1959 1960	110 137	62 43	.. 10	.. 2
42. Government Mining Polytechnic, Chhindwara.	Jany., 1960 April, 1960	24 46	10 14	.. 11	....
43. Annamalai Polytechnic, Chettinad.	1959 1960	116 113	41 29	14 (Information not received).	

1	2	3	4	5	6
44. Leather Technological Institute, Morar.	1957	9	3	..	..
	1958	10	2	..	..
	1959	10	7	2	..
	1960	10	2	..	..
45. Central Polytechnic, Guindy.	1959	206	46	12	4
46. Government Polytechnic, Sholapur.	1957	62	30	..	..
	1958	88	28	9	..
	1959	95	36	13	3
	1960	170	80	15	4
47. Alagappa Polytechnic, Karaikudi.	1959	115	46	20	6
	1960	116	39	..	..
48. Murhgappa Chettiar Memorial Polytechnic, Avadi, Madras.	1958	117	9	1	..
	1959	114	29	15	..
	1960	118	22	..	..
49. Kanahiya Lal Technical Institute, Roorkee.	1957	236	156	..	} No third attem- pt allo- wed.
	1958	146	5	15	
	1959	112	56	1	
	1960	86	18	6	
50. Valivalam Desikar Polytechnic, Nagapattinam.	1959	115	19	11	6
	1960	119	46	(Information not available.)	
51. R. C. Technical Institute, Ahmedabad.	1956	44	15	10	..
	1957	32	13	11	..
	1958	28	12	8	..
	1959	40	19	9	..
	1960	46	31	(Information not received).	
52. D. N. Technical Institute, Meerut.	1957	101	63	..	..
	1958	78	14	..	..
	1959	97	43	..	..
	1960	55	34	..	..
53. Sir Cusrow Wadia Institute of Electrical Technology, Poona.	1956	17	8	4	..
	1957	18	10	3	..
	1958	22	7	3	..
	1959	26	18	2	..
	1960	27	6	3	..

1	2	3	4	5	6
54. Government Polytechnic, Anantapur.	1959 1960	110 121	23 43	7 (Information not received).	5 re- cei- ved).
55. Maharaja's Technological Institute, Trichur.	1956 1957 1958	80 80 118	26 15 ..	15 12 ..	5
56. Ajmer Polytechnic, Ajmer.	1959 1960	55 60	13 15	.. 1	....
57. Government Polytechnic, Jaora.	1956 1957 1958 1959 1960	61 26 27 42 60	12 4 16 20 36	.. 2 1 2 3	..........
58. Government Polytechnic, Nowgong, M.P.	1957 1958 1959 1960	75 56 72 121	.. 8 27 99	.. .. 3 9	........
59. D. J. Engineering Institute, Baraut.	1957 1958 1959 1960	135 58 27 32	96 10 22 6	.. .. .. 2	.. (Not allo- wed).
60. Jodhpur Polytechnic, Jodhpur.	1959 1960	262 267	53 120	5 25	3 ..
61. Meharchand Polytechnic, Jullundur.	(For Civil Engg. Diploma Course).	1956 1957 1958 1959 1960	50 48 50 56 56	3 2 2 4 5	.. .. .. 2 3 4 ..
62. Overseers School, Nainital.	1958 1959 1960	100 85 68	4 43 5	.. 2 8	......
63. Government Leather Working School, Bombay.	1956 1957 1958 1959 1960	5 5 3 3 6	2 .. 1 .. 1	.. 4......	..........

1		2	3	4	5	6
64. Civil Engineering School, Ballia.	1957	271	215	..	..	..
	1958	96	..	17	..	..
	1959	29	12	..	..	..
	1960	45	34	6	..	..
65. Karnataka Polytechnic, Mangalore.	1958	83	2	3	..	..
	1959	288	68	8	2	..
	1960	176	14	12	..	1
66. Hooghly Institute of Technology, Hooghly.	1956	48	..	..	..	..
	1957	73	..	..	..	..
	1958	113	1	..	..	..
	1959	112	5	..	..	..
	1960	113	6	..	..	..
67. Samrat Ashok Techno- logical Institute, Vidishi.	1957	50	23	..	..	..
	1958	68	34	8	..	..
	1959	74	26	17	2	..
	1960	48	13	1	..	..
68. Technical College, Da- yalbagh.	1956	40	..	..	..	..
	1957	46	7	..	..	..
	1958	46	6	..	..	..
	1959	63	4	..	..	..
	1960	56	15	..	..	..
69. S. V. Government, Po- lytechnic, Tirupati.	April, '59	170	41	..	..	..
	Nov., '59	27	..	5	..	..
	April, '60	182	66	3	..	..
70. Orissa School of Mining Engineering, Keonjhar.	1957	24	9	5	..	..
	1958	33	15	4	..	..
	1959	40	9	1	..	..
	1960	33	4	2	..	..
71. Mining Institute, Koda- rma.	1959	40	16	3	..	..
	1960	34	5	..	..	..

ANNEXURE IX

(Item No. 14)

Scheme prepared by Expert Committee on Pedagogical Training of Technical Teachers

The Course in pedagogic training is intended for teachers of technical subjects in multipurpose or technical schools. These will be S.S.C. with a further training with Diploma from Polytechnics or holding some equivalent qualification.

Courses of Study

The course may be divided into the following five subjects :—

- (i) Principles of general and technical education.
- (ii) Educational Psychology.
- (iii) Methods of teaching technical subjects
- (iv) School, Class and Shop organisation.

In addition, the course would include supervised teaching practice and study of practical subjects. (For a list of Books suggested please see attached list).

(i) *Principles of General and Technical education* :—

- (a) Aims and ideals of general education, good citizenship and education of the whole man;
- (b) Aims and objects of technical education—increasing productive efficiency and inculcation of the sense of the dignity of manual work ;
- (c) Need for vocational bias in education for increasing the individual's productive efficiency;
- (d) Scope of technical education and its importance in modern times in industry, art and agriculture, with special reference to the economy of the country;
- (e) Comparative study of technical education in certain advanced countries.
- (f) Targets of technical education in five year plans.

(ii) *Educational Psychology* :—

- (a) Psychology of education—the psychological basis of learning and teaching ;
- (b) Human equipment ;
- (c) Principles of learning—motivation, learning and fixation;
- (d) Development of proper attitude to work;
- (e) Emotional growth—character formation;
- (f) Psychology of the group—Development of the team spirit.;
- (g) Individual differences and their significance in education;
- (h) Intelligence and measurement of intelligence;
- (i) Aptitudes and the testing of aptitudes;
- (j) Guidance and Counselling.

(iii) *Methods of teaching Technical subjects :—*

- (a) Principles of learning applied to teaching practical skills and related information;
- (b) Methods of teaching applied to trade and industrial subjects—lecture and discussion, demonstration, assignment and project methods;
- (c) The planning and preparing lessons;
- (d) Use of instructional aids and materials;
- (e) Development and use of audio-visual aids;
- (f) Analysis and construction of courses of study—Need and purposes of trade analysis and course building, techniques in analysing a trade, making an analysis with regard to operations and tools ; selecting the jobs as vehicles of instruction;
- (g) Essentials of syllabii in technical subjects;
- (h) Analysis and valuation of individual differences as applied to job hours.
- (i) Visits to workshops—their planning, education and valuation.

(iv) *School, Class and Shop Organisation :—*

- (a) The roll of the headmaster, distribution of work among teachers, staff meetings for planning and evaluating work;
- (b) The time-table—Practice—theory ratio in teaching of the technical subjects;
- (c) Shop organisation and management—Shop planning and layout; maintenance of tools and equipment, selection, purchase, storage and control of tools, material, supplies and equipment. Control of the physical conditions of the shop; safety precautions and liability;
- (d) The school building, the School furniture class-room hygiene;
- (e) Maintenance of records and reports;
- (f) Organisation of sports and co-curricular activities;
- (g) Organising teacher-parent associations;
- (h) Problems of discipline and methods of maintaining discipline;
- (i) Need for the development of guidance programmes and responsibility of teachers in guidance and counselling.

The time available for the study of the above subjects will be 216 hours in the period of 12 weeks. The distribution of the hours may be as follows :—

- (i) 40 hours per subject for lectures and discussions;
- (ii) 12 hours per subject for seminars including preparation and reading; and
- (iii) 8 hours for visits to factories and workshops (two visits of 4 hours each).

(v) *Practice Teaching—(20 lessons)—90 hours :*

Any two of the following subjects :—

- (i) Elements of Mechanical Engineering;
- (ii) Elements of Electrical Engineering;

(iii) Drawing ;

(iv) Workshop subjects (trades).

A student should be allowed to choose any two workshop subjects.

Lessons should deal with theory as well as practice. The remaining portion of 90 hours allotted for Practice Teaching should cover the following :—

(i) Preparation of lessons, observation of demonstration lessons, group discussions of lessons.

(vi) *Trade Practice*—(40 hours):

A sufficient number and variety of jobs to be planned out and executed according to each trade; organisation of training—practical class, job-analysis, operating steps.

List of Books suggested for courses of study in Pedagogical Training

Subjects

Text Books suggested

PRINCIPLES OF GENERAL AND TECHNICAL EDUCATION

(a) Aims and ideas of Gen. education, good citizenship and education of the whole-man.	}	CREATIVE TEACHING IN INDUSTRIAL ARTS & VOCATIONAL EDUCATION. F. Theodore Struck, Chapman & Hall Ltd., London.
(b) Role of Education in developing democratic citizenship.		
(c) Development of personality of leadership.		
(d) Aims & objects of Tech. Education	}	1. ACHIEVING THE OBJECTIVES OF EDUCATION : Minneapolis Public School. 2. GUIDE TO IMPROVING INSTRUCTION IN INDUSTRIAL ARTS: American Vocational Association, 1010, Vermont Avenue, N. W. Washington, D.C.
(e) Need for Vocational bias in education for increasing the individual productive efficiency.		
(f) Scope of Technical Education & its importance in modern times in industry.		

EDUCATION PSYCHOLOGY

(a) Psychology of Education.	}	CREATIVE EDUCATION : Dr. M. A. Payne, Chetna Ltd., 34, Ratanpart Row, Bombay-1.
(b) Human equipment.		
(c) Principles of learning—Motivation, Learning & Fixation.	}	1. PRINCIPLES OF TRADE & INDUSTRIAL TEACHING: Selvidge R.W. & Frybeland Peoria, A Bennet Co. 2. CREATIVE TEACHING IN INDUSTRIAL ARTS & VOCATIONAL EDUCATION. F. Theodore Struck, Ph. D. Chapman & Hall Ltd., London.
(d) Acquisition of skills and formation of habits.		
(e) Development of proper attitude & work.		
(f) Emotional Growth, Character, formation.		

- | | | |
|---|---|---|
| (g) Individual differences and their significance in education. | } | 1. METHODS OF TEACHING INDUSTRIAL SUBJECTS : Leighbody Gerold B. Albany, Delmar Publishers. |
| (h) Intelligence & measurement of intelligence. | | |
| (i) Aptitudes & the testing of aptitudes | | |
| (j) Guidance & Counselling. |  |  | 2. MEASURING EDUCATIONAL ACHIEVEMENTS : Michels William J. Karnes. McGraw-Hill Book Co. |

METHODS OF TEACHING TECHNICAL SUBJECTS

- | | | |
|---|---|---|
| (a) Principles of learning applied to teaching practical skills & related informations. | } | 1. METHODS OF TEACHING INDUSTRIAL SUBJECTS : Leighbody, Gerold B. Albany, Delmar Publishers. |
| (b) Methods of teaching applied to trade and industrial subjects etc. | | |
| (c) Planning and preparing lessons | | |
| (d) Use of Instructional aids and materials. | | |
| (e) Development & Use of Audio-visual Aids. | | |
| (f) Analysis & Construction of Courses of study etc. | } | 1. COURSE CONSTRUCTION IN INDUSTRIAL ARTS & VOCATIONAL EDUCATION : American Technical Society, J. W., Giachino, Ralph, Galington.
2. TRADE OF JOB ANALYSIS : Frykland Vernces Bruce Publishing Co. |
| (g) Essential of syllabii. | | |
| (h) Analysis and valuation of individual differences as applied to job hours. | | |

SCHOOL. CLASS AND SHOP ORGANISATION

- | | | |
|---|---|--|
| (a) The role of the Headmaster, etc. | } | 1. TEACHING SUCCESSFULLY THE INDUSTRIAL ARTS & VOCATIONAL SUBJECTS : Silvius, G. Herold & Curry, Bloomington, Mcknight & Micknight Publishing.
2. AN OUTLINE OF THE ORGANISATION AND MANAGEMENT OF VOCATIONAL CLASSES : Canapaigne, George E ; Duluth Public School, Vocational Education Deptt.
3. COURSE MAKING IN INDUSTRIAL EDUCATION : Peoria : Chass A. Bennette Co. |
| (b) Time Table, prectice theory, ratio etc. | | |
| (c) Shop Organisation & Management layout storage & Control of tools etc. | | |

ANNEXURE X

(Item No. 15)

Revision of estimates of cost of cycle sheds for Technical Institutes

I forgot to mention at yesterday's meeting that the suggestion made by the All India Council for Technical Education that the cycle stand should cost Rs. 20 per unit, is not correct. The stand has got to have some cover and I have constructed many a stand for more than 2,000 cycles, and on an average they have cost about Rs. 40 per stand or the actual cost has been Rs. 3,950 for 108 cycles. I suggest that these views be conveyed to the All India Technical Council.

I shall also thank you to send me the draft of the resolution regarding the location of the engineering colleges without consultation with the Western Regional Committee.

ANNEXURE XI

(Item No. 16)

Extracts from the Proceedings of 24th meeting of University Grants Commission held in New Delhi on the 9th September, 1960

Item No. 31.—To consider the question of revision of salary scales of teachers in Engineering and Technological Institutions.

The Commission agreed that teachers in Technical subjects in Engineering Colleges and Departments in the Universities be placed on the scales of pay recommended by the A.I.C.T.E. at its annual meeting held in April, 1958. The Commission also agreed that teachers should be placed at "the next higher stage" in the revised grade w.e.f. 1st April, 1960. Grants for this purpose will be paid on a hundred per cent basis for a period of five years.

	Class A (Post-graduate Institutions)	Class B Institutions teaching up to 1st degree)
Director/Principal	Rs. 2000-2500 (in exceptional cases an additional pay of Rs. 500 may be allowed.)	Rs. 1300-1800
Professor	Rs. 1600-1800	
Professor (Ordinary scale)	Rs. 1000-1500	Rs. 1000-1500
Asstt. Professor	Rs. 600-1150	Rs. 600-1150
Lecturers	Rs. 350-850 with a starting salary of Rs. 410 p.m.	Rs. 350-850 with a starting salary to Rs. 410 p.m.
Workshop Superintendent	Rs. 600-1150	Rs. 600-1150

Teachers in other branches including Pharmacy, Applied Physics, Radio Physics, Electron and Applied Chemistry will be on the same scales of pay as similar teachers in other faculties of the Universities.

Scale for staff in Polytechnics

Designation of Post	Salary Scales
Principal	Rs. 800—1250
Head of the Deptt. (Lecturer-in-charge)	Rs. 600—1000
Workshop Superintendent	Rs. 350—850
Lecturer	Rs. 350—850
Senior Instructor	Rs. 260—500
Junior Instructor	Rs. 160—300

ANNEXURE XII

(Item No. 17)

Project Report on the Central School of Printing The objective and the reason for establishment of such a School

Need for setting up of the Central School of Printing is due to the fact that industrialisation that has already taken place in India has brought out a revolution in the field of quality work both in letterpress and offset lithography printing. Demand for such a work is increasing by leaps and bounds. The impact of these demands had led to the opening of many new presses particularly in the field of offset lithography. A number of old presses have also expanded and added offset lithography to their letterpress plant. These presses are now experiencing difficulties for want of efficient and highly trained executives in the management. The Third Five-Year Plan is almost ready. The magnitude of the industrial plans is much more in this than what had been in the First and Second Five-Year Plans. The outlay on the Second plan was Rs. 4,800 crores with emphasis on Agriculture and the outlay on the Third plan as estimated is roughly Rs. 10,200 crores. There is bound to be an increase in the number of sizeable presses to meet the demand of further industrialization under the Third plan. There is already a big gap in meeting the demands for trained technical personnel for higher executives for efficient and economic management of the presses particularly those engaged in quality printing. Shortage in this field is critical and no time should be lost in starting the Central Printing School in order to meet the pressing demands for the trained and higher executives and qualified hands for research and development in the printing industry. It is quite possible that one school may not be in a position to meet the ever-increasing demands of the printing industry. However, one such school may be started immediately in the first instance. The Specialist Committee of the All India Board of Technical Studies in Applied Art reported in 1949-50 that such a school should be started after the Regional Schools start functioning. Four Regional Schools have already started functioning. Central School may now be set up without further loss of time. New presses—Government and private—already started are waiting for highly trained personnel in the field of management. At present, Government are sending their assistant managers for training abroad. Private presses are engaging persons as soon as they return from abroad. In the event of setting up of the Central School, there should hardly be any further need for students going abroad for such training or research in such large numbers as they are doing now in the absence of such facilities at present in the country. The number of such students would roughly be 40 to 50 each year. At present some of the firms such as Hindustan Times, New Delhi, Times of India, New Delhi and Bombay, Chromotype, Calcutta are engaging foreign experts at a very high salary to run their printing establishments. Necessity of engaging foreigners will also gradually disappear when the students from the Central School are employed in the industry and eventually become experienced to hold such position.

The purpose of setting up of the Central Printing School will be to provide facilities for preparing the students to play an effective role in the ever-expanding areas of Graphic Arts, photography, printing and packaging industry with the help of a body of skilled and trained teachers. Considerable proficiency and technical knowledge are necessary for those

who are eventually to hold responsible executive and administrative positions in the top and middle level management of the printing and kindred industry. Necessary standard of skill, proficiency and technical knowledge can be acquired only with the aid of an efficient teaching staff in an institution like the Central School of Printing.

The standard of courses in the Central School, should be sufficiently high and comprehensive enough so as to develop sound operational skill combined with technical knowledge which are so very essential in holding responsible executive positions in the management of a modern up-to-date printing press. There is no such institution at present in this country. This will be the first of its kind in India. On successful completion of the prescribed course in the Central School, a student will be awarded the National Diploma in Printing Technology which will be equivalent in standard to a university degree. This will be higher than the National Certificate awarded by the regional printing schools already set up at Calcutta, Bombay, Madras and Allahabad for Eastern, Western, Southern and Northern regions respectively. Graduates, preferably with Physics, Chemistry and Mathematics will be admitted to a 3-year full-time course in this Printing Institute. The regional schools have been set up by the State Governments with the financial aid from the Central Government. These are run by the State Governments according to the syllabus approved by the All India Council for Technical Education. The syllabus for the regional schools are suitable for training junior supervisory staff of Foreman type. On passing out from the regional schools the students are awarded National Certificate. Students after passing National Certificate Course from the regional schools will also be eligible for admission to the National Diploma course of the Central School provided they spend at least 2 years in the printing industry. They will be admitted to a separate full-time course of 2 years duration. After passing the National Diploma course from the Central School a student will be qualified to be employed as an executive trainee or an assistant in the first instance, and eventually with more experience will be promoted to a suitable higher executive and administrative position. They will also hold key positions in the technical branches to control production of high quality jobs requiring considerable technical knowledge and professional skill.

Besides providing facilities for technical education for developing managerial talents, the Central School will also be engaged in Graphic Arts research and development. This will have to be done in cooperation with the printing firms, machine and equipment manufacturers and suppliers of materials. As the research and development will ultimately benefit the Graphic Arts industry as a whole it is expected that the firms interested in these fields will actively associate with research and development programmes of this department of the Central School.

The Central Printing School will also arrange for teaching special subjects such as printers' engineering, teachers' training, ink and roller composition, paper, alloys and metals etc. used in the printing trade and also short specialised technical courses in letterpress, offset lithography and photogravure printing to enable senior supervisory staff or technicians already in employment to increase their knowledge and to improve their skills in the selected areas of Graphic Arts with which they are concerned. There will also be special classes in administrative subjects such as management studies, costing, estimating etc.

Special emphasis will have to be laid on the teaching of what is known as Graphic Arts in the Printing industry. Offset, gravure, & Photo-engraving presses employ photographic process for the reproduction of pictures and designs drawn by the artists. These methods in the printing industry are known as Graphic Arts. Thorough knowledge of photography and its application in these areas is essential. Therefore, a very advanced course in photography will also have to be included in the full-time course of the School. The machinery and equipment in all the departments of the School including research will have to be provided in the School. The machinery and equipment in all the departments of the School including research will have to be most up-to-date in order to give the students a thorough understanding of their mechanism and also to create confidence in them for handling complicated machinery of latest design.

In planning for accommodation for the Central School it should be borne in mind that sufficient margin should be kept for future expansion in the various branches including research and information services. Some of the branches such as offset, photogravure and research will have to be air-conditioned.

Courses

The courses in the Central Printing School will be designed with the object of preparing the students for holding positions of responsibility in the management of the printing presses. They will also hold key technical positions requiring considerable professional and technical qualifications in the field of quality printing. The award on successful completion of the course will be the National Diploma in Graphic Arts and Printing.

The curriculum for studies will broadly comprise the following fields.

- (i) Technical Processes.
- (ii) Design & Photography.
- (iii) Science.
- (iv) Administrative subjects.

(i) Technical processes

Technical processes will be divided in three main groups *viz.*, letter press, offset lithography and gravure.

A. Letterpress printing

The following courses will be provided under letterpress printing

- (a) Hand composition and composition on Ludlow machines.
- (b) Mechanical Composition on Monotype Keyboard.
- (c) Monotype casters.
- (d) Mechanical composition on Linotype and Intertype,
- (e) Proof correcting,
- (f) Letterpress plates and cylinder machine printing.
- (g) Letterpress rotary printing machines,
- (h) Electrotyping and Stereotyping,
- (i) Photo-engraving,
- (j) Book Binding.

B. Offset Lithography

The following will be the courses of study for the offset lithography printing:—

- (a) Basic lithography,
- (b) Lithographic drawing,
- (c) Foto-setter,
- (d) Just O Writer,
- (e) Camera operating,
- (f) Photo-litho retouching and air brushing,
- (g) Photo-litho plate making,
- (h) Lithographic hand printing,
- (i) Lithographic machine printing.

C. Photo-gravure

The following will be the courses of study for the photo-gravure printing :—

- (a) Camera operation,
- (b) Retouching, Carbon printing and etching,
- (c) Machine printing.

(ii) Design and photography

- (a) Commercial design,
- (b) Typographic design,
- (c) Lettering,
- (d) Book design
- (e) Magazine design,
- (f) General drawing and design,
- (g) Figure drawing,
- (h) Illustration,
- (i) Colour training,
- (j) Book binding design,
- B. (i) Photography,
- (ii) Graphic Reproduction.

(iii) Science

- (a) Science for photography students
- (b) Science for students of graphic reproduction,
- (c) Science for letterpress printers,
- (d) Science for electro-types and stereo-types,
- (e) Science for monotype casters,
- (f) Science for book-binders,
- (g) Science for photo-engraving,
- (h) Science for lithography,
- (i) Science for photo-gravure,
- (j) Science for printing ink, paper and printing metals.

(iv) Administrative Subjects

- (a) Management,
- (b) Costing,
- (c) Estimating

Special Technical Courses

The Central School will provide short-term, special technical courses in letterpress, offset, photo-gravure, including design and graphic reproduction and packaging if sufficient number of candidates is sponsored by the industry or sufficient number of individuals apply for arranging such a course in any particular subject. It will also arrange short courses for training the teachers including those who are already engaged in the various printing schools in the country.

There are other specialised branches which can be started soon after the school gets going. Some of these are as follows :—

- (i) Silk Screen,
- (ii) Flexicographic printing,
- (iii) Laquering tin foils,
- (iv) Tinplate varnishing,
- (v) Tinplate offset,
- (vi) Rotary numbering,
- (vii) Printer's Engineering.

Soon after starting the main branches of printing the School will continue to grow and other branches can be added as and when required. In other words the various other courses will have to be developed in subsequent phases.

Research

One of the most important functions of the Central School of Printing will be the research in the field of printing, packaging and allied trades. The main purpose of research will be to apply science and engineering principles to the problems of these industries. Close liaison will have to be established with the printing firms, equipment manufacturers and suppliers of materials and other similar research laboratories in other countries. Subjects for the research will be chosen in close liaison with them and the results of testing investigation, development and research would be made available to the member firms without any restriction.

The activities of the research laboratory will be confined to the problems of production difficulties of the member firms. Routine tests on behalf of members to ensure supplies up to the standard will also be done provided such tests do not interfere with the programme of investigation of production difficulties which will have to be reported to the members from whom such enquiries would be received. It will also be one of the activities of the research laboratory to develop new techniques and undertake investigations of various problems of the printing trade such as fluffing of paper, ink drying, rub resistance, the optical properties of paper, choice of screen rulings etc. Problems of the packaging industry will also be investigated. But this should be undertaken after organising the research laboratory for the printing industry in the first instance.

It will also be the function of the Research Unit to organise the conferences on important technical points relating to the printing and packaging industry or take part when considered essential in important discussions or conferences etc. when organised by international printing research institutes. Important papers that might be read in the conferences and the discussions on the subjects may also be got printed in book form and made available to the member firms.

There will be a set of liaison officers who will visit the member firms which will facilitate the flow of information from the laboratory to the firms and from the firms to the laboratory. Such visits will help to create active interest in the member firms which will ultimately benefit the entire printing and packaging industry.

A programme will be drawn up in advance every year from the enquiries of the member firms regarding the difficulties experienced by them particularly in the application of science and engineering principles in the printing and packaging industry. It should be staffed by competent scientific technical and Engineering personnel to deal with the subjects competently.

The Research Unit will undertake to provide facilities to the students who will pass the Diploma course with credit for carrying out research under the guidance of the experienced teachers for two years. On the completion of the period they will have to submit a thesis and if accepted will be awarded post-graduate diploma. The Research Unit will be organised more or less on the basis of the Printing, Packaging and Allied Trades Research Association in U. K.

Information Service

The main function of the Information Service will be to collect news and data from the varied sources and to help printers to find up-to-date information about practical and technical aspects of this industry. Subject matter of such publications will be classified, abstracted and indexed by the Information Service to be made available to the research department and other interested members.

Generally experts discuss their findings in various publications. Information Service staff will collect such publications for which they will have a separate wing of specialised character in the main library of the School. This Wing will be utilised only by Information Service and the Research Unit. Without the help of technical literature no scientific research is possible and no technical personnel can be up-to-date without the information regarding the latest technique or new developments in his trade. Therefore, the special wing of the library should be set apart for the Information Service and the Research Unit of the Central School of Printing.

Equipments for the various departments of the School

This school should be provided with the most up-to-date equipment and machines so that the students get an opportunity to learn operational technique on the latest machines and equipment. Each department of the School will be so equipped that the students get facilities to have sufficient practice in order to develop confidence in handling and running highly complicated machines. Practical training will be one of the most essential features of the training which will be backed by an advanced theoretical course.

The machines and equipment to be provided in each department are as in Appendix I.

The Institute must have adequate facilities for preparing the students in all branches of printing and packaging industry to enable them to hold responsible executive positions in ever-expanding area of graphic arts. It is, through such instructional facilities the Institute will be in a position to maintain a constant flow of trained man-power for the printing and kindred trade. Along with educational facilities, the research and development unit aided by an information service the institute will help to benefit the entire industry in the long run.

Although the long term objective would be to have all the facilities for training in all the branches of Graphic Arts Industry, it would be desirable in the initial stage to provide for Letterpress and Offset Lithography only.

Photogravure can be introduced in the next phase. The reason for postponing to next phase is due to the fact that this process will require elaborate arrangement for air-conditioning and provision for disposal of dangerous chemicals etc. which will take long time to complete and will thereby delay the project. Moreover, from financial point of view also it is considered desirable to develop the institute in two or three phases.

In the first phase, the equipment and machinery have been provided for Letterpress and Offset Lithography only. Quantity provided has been kept to the minimum. The educational facilities will also be confined in these two branches only. The research and information service will also be started in the first phase. In these two branches of printing industry, particularly in the Offset Lithography, there is acute shortage of qualified hands for taking up responsible positions. After completely equipping the Letterpress and Offset Lithography for theoretical and practical training, next step would be to introduce photogravure. When photogravure is introduced, then the facilities for all the three branches of printing *viz.* Letterpress, Offset Lithography and Gravure—will be complete. The list of equipment, machinery is given in Appendix -I so that the preliminaries for the introduction of gravure can be taken up and completed before the completion of the first phase, *i.e.* Letterpress and Offset programme so that the action for the introduction of gravure in the second stage can be taken without any loss of time.

Other specialised branches of printing such as Silk Screen, Flexographic (aniline) printing, Laquering tinfoils, Tinplate varnishing, Tinplate Offset, Die Stamping, Rotary numbering, Slotting, Carton Glueing, Bronzing Blocking and embossing, Tab and index cutting etc. including packaging can be introduced soon after the facilities for gravure printing are completed. There are many labour saving devices. These should be introduced as and when convenient. There are numerous other specialised items which should be tackled by a competent staff having the background in printing technicalities.

If the principle of developing the institute in phases is approved it will still be necessary to provide land etc. for construction of the buildings etc. keeping in view the shape of things to come in the end together with some margin for future expansion. For this purpose, it is estimated that the requirement for land would be about 50 acres.

National Diploma Course (equivalent to degree) in the Central School of Printing

Graduates will be eligible for admission to the 3-year full-time course. There will also be a 2-year full-time course for the students who will pass the National Certificate Course of the Regional printing Schools provided they serve in the Printing industry at least for 2 years.

In the first phase, the school will have only full-time courses. In the second phase, in addition to the full time courses there will also be part-time instructions in the various specialised subjects of printing and kindred trade for which classes will have to be opened in the day or in the evening. On completion, the students will be awarded a course certificate.

Students passing the National diploma course will be eligible for admission to Research department for 2 years and on completion of this period students concerned will have to submit a thesis. If accepted, the award will be Post-graduate diploma in the particular branch of printing on which thesis will be written.

Syllabus

The full courses will be of 3 and 2 years' duration respectively for the graduates and regional School students and on the successful completion the award will be the National Diploma. In addition to the full courses there will also be specialised courses of shorter duration of 6 to 9 months in various subjects when there is sufficient number of candidates for taking up such courses in the day or evening classes.

The curriculum will comprise of subjects relating to the technical processes, business administration, science and design including photography. There will be facilities for practical instructions in printing and related processes. There will also be a library for the use of the students attending the courses in the school. The courses will also include accounting, costing, estimating along with business administration. Visits to the manufacturing concerns connected with printing trade/materials and equipments will be arranged. The course will also provide for facilities for case study and seminars in various subjects.

The subjects to be taught in the full courses of the School and the examination scheme are given in Appendices II and III respectively.

The summary of financial effects (approximately) is given below :—

Non-recurring :

Land—50 acres @Rs. 6 per sq.ft. yard. . Rs. 14.50 lakhs.

Buildings :

- A. Institute including Administrative Buildings, Institute Building and Research & Specialised courses building 1,55,000 sq.ft. plinth including cost of electric installations, air-conditioning etc. (30,000 sq.ft.) framed structure and remaining 1,25,000 sq.ft. factory structure. Rs. 25.20 lakhs.

B. Hostel for 180 students :

1. 30 single seated rooms @ 200 sq.ft.	6,000	} Rs. 6.30 lakhs.
2. 50 three seated rooms @ 180 sq.ft. per student.	27,000	
	33,000	
3. Hostel equipments and furniture .	Rs. 1.00	„
4. Dispensary with 4 beds	Rs. .25	„
5. Miscellaneous for electric connections etc.	Rs. .25	„
	Rs. 7.80	„
Say .	Rs. 8.00	„
C. Staff quarters at the rates approved for the Regional Engineering Colleges.	Rs. 19.00	„
Equipments for Regular Courses, Research and Specialised Courses including Library (Rs. 50,000)	Rs. 74.80	„
TOTAL NON-RECURRING	Rs. 141.50	„
Say .	Rs. 142.00	„

Recurring :

1. Pay of Staff	Rs. 6.70	„
2. Consumables (chemicals, paper, binding material etc. etc.)	Rs. 1.50	„
3. Power and Water	Rs. 0.07	„
4. Scholarships (for 25% students)	Rs. 0.86	„
TOTAL RECURRING	Rs. 9.13	„
Say .	Rs. 9.2	„

APPENDIX I TO ANNEXURE XII

Equipments

Name of Equipment	Unit	Cost	Remarks
1	2	3	4
		Rs.	
Hand Composition			
1. (a) Composing Frame	8	90,000	} From ANDEX and F.A. G. Swiss Firms.
(b) Imposing Surface	4	36,000	
(c) Galley racks	4	9,000	
2. Steel chases (To be included while ordering the printing machines).			
3. Combined forms and lead racks	3	} 18,000	
4. Pigeon hole units	3		
5. Forme rack in steel	3		
6. Composing sticks	45		
Setting rules, etc..	60		

Name of Equipment	Unit	Cost	Remarks
1	2	3	4
		Rs.	
7. Lead and rule cutter	2	1,400	} From ANDEX and F.A. G. Swiss Firms.
8. Power Saw Trimmer	1	15,000	
9. Proof Press (cylinder)	2	70,000	
10. Galley Proof Press	4	20,000	
<i>Additional items</i>			
(i) Foundry type . . . . .	..	20,000	}
(ii) Crescent page make up Gauge	1	1,000	
(iii) Mounting Boards . . . . .	..	600	
(iv) Pre-make ready equipments (F.A.G.) . . . . .	..	10,000	

Mechanical Composition

11 & 12. Slug casting (slug) :—

(a) Line Model 78 SE	1	} 6,20,000
Line Model 70	1	
Intertype SM	1	
Intertype T.T.S.	1	
(b) Ludlow	1	}
(c) Nebitype	1	
EL rod	1	}
13. Mono-type Key Board	4	} 5,00,000
14. Ancillary equipments for item 13 . . . . .	..
15. Mono-casters	4	
Super-casters	1	
16. Matrix Sets . . . . .	..
17. Air Compressor	1	}

Letterpress Printing Machines

18 to 25. (i) Heidelberg 15 × 10	1	} 10,00,000
(ii) Victoria Type	1	
(iii) Kluge or Chandler Type Platen	1	
(iv) Vertical Miehle	1	
(v) Mercedes 15 × 22	1	
(vi) Albert 15 × 22	1	
(vii) Nebiole Super Andex	1	
(viii) Dawson Payne & Elliot-Stop/ Cylinder 20 × 30	1	
(ix) Miller Two-Colour—22 × 28	1	
(x) Heidelberg Single Cylinder— 20 × 27—5/8	1	
(xi) Miehle 26 × 40½	1	
(xii) Nebiole Urenia DSK—31 × 44	1	
(xiii) (a) Letter Press, Rotary and Form Printing Rubber	1	
(b) Single Unit Crabtree News- paper Rotary—Metal	1	
(xiv) Extra chases for each of the above machines	4	}

Name of Equipment	Unit	Cost	Remarks
1	2	3	4
Binding Equipment		Rs.	
<i>Cutting Machines</i>			
26. (a) Electric (Polar)	1	60,000	
(b) Hydraulic (Krause)	1		
<i>Folding Machines</i>			
27. (a) Baum	1	80,000	
(b) Brehmer	1		
28. Varnishing & Calendering	1	40,000	
29 & 30. (a) Wire Stitching	1		
(b) Gathering and wire-stitching with three knife trimmers	1		
<i>Additional items</i>			
(i) Die Stamping	1	2,50,000	
(ii) Copper plate printing machine	1		
(iii) Disc. ruling Machine	1		
(iv) Forme Trolley	1		
(v) Book Backing and Rounding	1		
(vi) Ledger Punching	1		
(vii) Spiralling	1		
(viii) Gold blocking	1		
(ix) Treadle perforating	1		
(x) Board cutter and shear	1		
(xi) Rules Binder	1		
(xii) Punching and Eyeletting	1		
31. Book Sewing	1	30,000	
32. Rotary perforating and gathering	1	40,000	
33. Paper Drill	1	11,000	
Graphic Reproduction			
34. (a) Dark Room process Camera vertical type	1	1,50,000	
(b) Gallery type	1		
(c) Regent	1		
35. Exposure Cabinet	1	18,000	
36. <i>Additional items</i>			
(i) Prima Gravure Printing Machine	1	3,20,000	
(ii) Plating Machine (Electro)	1		
(iii) Carbon tissue laying machine	1		
(iv) Etching trough Powerless. Etching Machine	1		
(v) Arc Lamp	1		
(vi) Printing down Frame vacuum	1		
(vii) Layout and Register Table	1		

Name of Equipment	Unit	Cost	Remarks	
1	2	3	4	
		Rs.		
(viii) Aniline and Gravure combined with accessories for making Gravure cylinders	1	}		
(ix) Miscellaneous Grinding Machines and Tools . . . . .	..		
37. (a) Velox Graining Machine 30 × 40	1	}		
to 44. (b) Whirler Graining Machine 30 × 40	1			
(c) Vacuum Printing Frame 30 × 40	1			
(d) Three Point Arc Lamp 30 × 40.	1			M/s. Klimsch & Co. Frankfurt, Main.
(e) Layout & Stripping Table 30 × 40	1			
(f) Retouching Table 30 × 40	2			
(g) Drying Cabinet 30 × 40	1			
(h) Dark Room Lamps	1			
(i) Densitometer for Transmission and Reflections Kodak	1			
(j) Colour Viewer	1			
(k) Trimming Device Meto Schmit	1		4,50,000	
(l) Klimsch Regent Camera with all attachments including Variomat and Reprocolour—24 × 24	1			
(m) (a) Klimsch Contract Frame 30 × 40	1			
(b) Screens 120, 133 Circular	1			
(c) Durst Enlarger—GI 39	1			
(n) Vario Klischograph 133 or 120 Screen (from Dr. Mg. Rudelf Hall, Germany)	1			
(o) Roter Whirler 30 × 44	1			
(p) Electric Etching Machine for Copper	1			
(q) Burning-in Oven	1			
(r) Plate Clearing Table	1			
(s) Plate Guillotine	1			
(t) Circular and Oval Tracer	1			
(u) Squaring up Base with T	1			
(v) Routing Machine	1			
(w) Bevelling	1			
(x) Circular Saw	1			
(y) Jig Saw	1			
(z) (a) Mailing Machine				
(b) Hole Punching Machine				

Name of Equipment	Unit	Cost	Remarks
1	2	3	4
		Rs.	
(c) Unit for processing Coloured Transparencies and colour prints: Kodak or Gaevart.			
(d) Aniline unit with Gravure combined with accessories for making Gravure Cylinders.			
(e) Sound Projector			
(f) Epidiascope			
(g) Ink Grinder			
(h) Ink Mixer			
(i) Roller Cleaning Machine			
(j) Pantograph			
(k) Draftsman Table.			
<i>New Items (Equipments for Type Foundry)</i>			
(a) Dekel Tupe Pantograph with accessories			
(b) Benton Type			
(c) Equipment for Pattern Making			
(d) Frate Saw for Pattern Making			
(e) Hydraulic Press for Punching Matrices			
(f) Universal Type Caster (Automatic with Moulds)			
(g) Lead and Rule Caster			
(h) Dressing Bench Equipment			
(i) Photo Composing Machine of other types			
(j) Mechanical Typesetting Machine (Japanese)			
45. Step and Repeat Camera . . . . .	..	50,000	
46. <i>Photo-composing</i>			
Photosetter	1	} 2,25,000	
Monophotoes	1		
47. Air Brush Drawing Board . . . . .	..	1,000	
48. <i>Proving & Revising Machine</i>			
Milander Proof Press	1	} 1,00,000	
Hunter Penrose	1		
Multi Lith	1		

Name of Equipment	Unit	Cost	Remarks
1	2	3	4
			Rs.
Offset Printing Machine			
49. Rolland	1	1,40,000	(Together with extra blankets, plates & accessories.)
50. M. A. N. (2 Col.)	1		
Workshop			
51. Lathe	1	1,15,000	
52. Lathe (Universal)	1		
53. Milling	1		
54. Drilling	1		
55. Shaping	1		
56. Welding	1		
57. Metal pots	3	30,000	
58. Roller casting	1	25,000	
59. Knife Grinding	1	20,000	
60. Stereo pots	1	30,000	
61. Stereoplate caster	1		
62. Forme Trolley	3	4,000	
63. Forme storage cabinet	2	7,000	
64. Rotary Plate casting equipment	1	35,000	
65. Precision Planning Machine	1	25,000	
66. Routing Machine	1	30,000	
67. Matrix Rolling Machine	1	45,000	
68. Plate finishing Machine	1	15,000	
69. Moulding Press	1	35,000	
70. Electrotyping Plant (small unit)	1	50,000	
71. Pots for packing up Electons	1	5,000	
72. Silver spray	1	5,000	
73. Hydraulic Moulding Press	1	30,000	
74. <i>Miscellaneous items:</i>			
Type light numbering, numbering, etc.	Hand	30,000	
75. Research . . . . .	..	2,00,000	
76. Library Books . . . . .	..	50,000	
		64,82,400	
		Say Rs. 64.80 lakhs	

APPENDIX II TO ANNEXURE XII

36 hours per week.

32 weeks in a year.

Sl. No.	Subject	No. of hours in a week	
		Theory	Practical
Two Year full time course			
FIRST YEAR			
1	Book Binding	1	2
2	Composing including Ludlow	1	2
3	Line composition	1	1
4	Letterpress Cylinder & Platen	1	2
5	Litho printing	2	2
6	Photo engraving	2	2
7	Design	1	2
8	Engineering Drawing	1	1
9	Science	2	1
10	Costing	2	..
11	Estimating	2	..
12	Economic aspects of Industry and Commerce.	1	..
13	Evolution of Modern industrial Organisation.	1	..
14	Financial accounting and costing	1	..
15	Nature of management	2	..
		36	
SECOND YEAR			
1	Electro-typing and Stereo typing	1	2
2	Mechanics	1	..
3	Letterpress Rotary printing	1	2
4	Mono-type composition	1	1
5	Monotype casting	1	1
6	Photo gravure process	1	2
7	Silk Screen printing	1	1
8	Photography	1	2
9	Photo-litho plate making	1	1
10	Photo-mechanical development	1	1
11	Costing	1	..

SECOND YEAR—*contd.*

Sl. No.	Subject	Number of hours in a week	
		Theory	Practical
12	Estimating	1	..
13	Financial accounting and Cost accounting.	1	..
14	Local aspect of industry	1	..
15	Office organisation and method	1	..
16	Statistical methods	1	..
17	Work measurements and incentives	1	..
18	Applied Science	1	2
19	Design	1	2
		36	

Three Year Full Time Course

FIRST YEAR

1	Book Binding	1	2
2	Composing (hand) including Ludlow	1	2
3	Line composition	1	2
4	Mono Keyboard	1	2
5	Mono casting	1	2
6	Design	1	2
7	Engineering Drawing	1	1
8	Photo-engraving	1	2
9	Letterpress cylinder and Platen	1	1
10	Lithography	1	2
11	Science	1	1
12	Costing	1	..
13	Book-keeping	1	..
14	Economic aspects of Industry and Commerce.	1	..
15	Evolution of Modern Industrial Organisation.	1	..
16	Nature of Management	1	..
17	Financial Account and Costing	1	..
18	Estimating	1	..

Sl. No.	Subject	Number of hours in a week	
		Theory	Practical
SECOND YEAR			
1	Electro-typing and Stereo-typing	1	2
2	Mechanics	1	..
3	Letter perss Rotary printing	1	2
4	Mono-key composition	1	2
5	Monotype casting	1	2
6	Photogravure process	1	2
7	Photogravure printing	1	2
8	Photo-litho plate making	1	2
9	Photo-litho printing	1	2
10	Costing	1	..
11	Estimating	1	..
12	Statistical methods	1	..
13	Work measurement and incentives	1	..
14	Office organisation and method	1	..
15	Science	1	2
16	Design	1	2
36			
THIRD YEAR			
1	Hand Composition	1	1
2	Maintenance and repair	1	2
3	Photogravure process	1	2
4	Photo-mechanical developments	1	1
5	Process Camera operating . . . . .	..	2
6	Silk Screen	1	2
7	Costing	1	..
8	Estimating	1	..
9	Factory management	1	..
10	Introduction to workshop	1	..
11	Management Accounting	1	..
12	Personnel Administration	1	..
13	Production planning and Control	1	..
14	Salesmanship	1	..

Sl. No.	Subject	Number of hours in a week	
		Theory	Practical
15	Design	1	2
16	Science	1	1
17	Photography	1	2
18	Photogravure printing	1	2
19	Letterpress Rotary . . . . .	..	2
20	Litho printing . . . . .	..	1
		36	

Subjects to be taught at the School:—

(a) DESIGN.—Theory and Practice

- (i) General drawing and design.
- (ii) Typographical design.
- (iii) Magazine design.
- (iv) Commercial design.
- (v) Illustration.
- (vi) Objective and figure drawing.
- (vii) Lettering.
- (viii) Book-binding design.

The students will be shown a wide variety of well designed printed work with a view to deal with the aesthetic, technical and economic problems which the designer is likely to face in getting the design printed.

Students will be taught the basic principles of design, history of letter forms and type faces, lettering and drawing, colour theory, requirements and limitations of the various processes, design for book and commercial printing. Discussion to be arranged immediately after visit to exhibitions, museums etc.

(b) PHOTOGRAPHY.—Theory and Practice

Retouching and finishing including Colour Photography and Advertising Techniques.

(c) COMPOSING.—Theory and Practice

(i) *Hand composition.*—Theory and Practice

Principles of setting and distribution, proof reading, the point system, table and tabular matter, book work, schemes of imposition, margins, dressing formes, locking up, ordering type and spacing material, display work, Ludlow composition, copy preparation and casting off, composing

Room equipment, planning and organisation, use of precision aids in the composing room.

(ii) *Mechanical composition*.—Theory and Practice

Monotype.—Plant and equipment, monotype system, matrix case layouts operating the keyboard and caster, straight composition book work, tabular work, catalogue, attachements, mechanical principles of the keyboard and caster, super caster, type and rule caster, maintaining efficient and economical production, the organisation and working of an installation.

Line-composition.—principles of intertype and linotype system, matrix and spaceband, the full range of moulds, procedure in relation to pre-makeready, production organisation, setting of commercial jobs including tabular work, the basic feature of machine, construction, operation and development.

Photo-composition.—The latest development in the photo-type setting

(d) LETTERPRESS MACHINE PRINTING.—Theory and Practice

Types of letter-press machine in general use and their suitability for various classes of work, ancillary equipment, making ready techniques care of ink, rollers and other materials, rotary presses, safety precaution, planning and organisation.

(e) FOUNDRY.—Theory and Practice

Materials; equipment, machinery and methods used in duplicate plate making, machine and hand moulding from type or line and half tone plates, casting stereo-type plates by hand and machine, newspapers stereo-typing, electro-type moulding, the preparation of electro-type moulds for depositing used Graphite or the silver-spraying process, electro-depositing copper, nickel and chromium finishing, finishing and mounting plates, thermo-plastic, thermosetting plastics and rubber plate making, the suitability and limitations of the various materials and processes used for duplicate plate making, planning and organisation.

(f) LITHOGRAPHIC PRINTING.—Theory and Practice

(i) Basic principles; treatment of lithographic surfaces; use of material and maintenance of equipment; transferring on hand presses; direct and offset proving; printing on direct and offset machines; adjustments and makeready, construction and working principles of lithographic printing machines; use of various types of plates in machine production; departmental estimating; planning and organisation.

(ii) Photo-lithography.—Materials and equipments used; printing down to metal and preparation of printing plates; colour work in line and halftone; multi-printing down; retouching and colour correction; deep etch methods; Multi-metal plate technique.

(g) BOOK-BINDING AND WAREHOUSE.—Theory and Practice

(i) Styles of book-binding; sewing by hand and by machine; quarter flush binding; library binding; letterpress and account book binding; marbling; indexing; loose leaf systems; finishing and gold blocking; mass

production equipment; materials and equipment; estimating; planning and organisation.

(ii) Machine Ruling—pen and disc machines; automatic feeder; run through and struck work; the standard ruling patterns; materials and equipments.

(iii) Warehouse work—folding machines; knife, buckle and combination; the make-up of sections; guillotines; wire and thread stitching machines; paper manufacture and finishes, standard sizes and sub-divisions; special papers, coated stock; paper trade customs; stock-keeping and storage; packing; layout of department, warehouse estimating.

(h) PROCESS CAMERA OPERATING

Photo-engraving and photo-lithography

Line and halftone screen negative making by the wet collodian and dry plate techniques, continuous tone negative making; contact and projection positives; colour separation.

Photo-engraving—Printing on metal; line etching

Tint laying and colour line work; halftone etching; line and tone combinations; finishing and mounting; ordering procedure and marking of the copy; modern developments including magnesium and other processes; electronic engraving.

(i) SCIENCE

Basic principles of chemistry and physics; Science applied to printing and binding; characteristics of prints by the various printing processes; paper technology; characteristics and limitations of papers; physical basis of colour and colour reproduction; colour measurement; metallurgy of alloys and metals used in the printing industry; electro metallurgy; chemistry and physics of photography; photo-mechanical processes and lithography; the specialised testing of paper, ink and adhesives; recent scientific developments in the industry. Basic principles of electronics and applications in the printing industry.

Mechanics

Force laws of concurrent and coplaner forces; work, power, horse power; friction and lubrication; machines; transmission of power by belt and gears; strength of materials; angular and linear motion; laws of motion; principles of simple mechanisms; elementary theory of hydraulics; machine drawing.

(j) BOOK-KEEPING

(i) Double entry book-keeping; the balance sheet; the cash book and petty cash book; the division of the ledger; books of prime entry; trial balance; trading and profit and loss accounts; sole trader and partnership accounts.

(ii) Accounts of joint-stock companies; self-balanced ledgers; taxation reserves and dividends; carbon copy methods; mechanised accounting; relation between financial accounts and cost accounts; printers' accounts.

(iii) Costing—purpose of costing; methods of costing; unit of cost; elements of cost-wage, material and expenses. Wages-method of payment, overtime night-work; time and work, recording, pay-roll routine; Analysis of wages; Direct and indirect operations; materials-control and storage of materials; purchase orders; routine of issue of purchase orders and receipt of goods; checking on receipt for both quantity and quality; maximum and minimum stocks; re-ordering level; storekeeping systems; work-in-progress; spoilage and overs; direct and indirect materials; forms and records for the receipt, control and issue of materials; methods of pricing; stock records; Expenses—classification, collection, allocation, appointment and recovery (Based on the Federation of Master Printers, London system.

(iv) Estimating—Study of estimating methods; operational times; machine out-puts in various departments; calculation for determining the amount of cost of materials. On the basis of the principles as explained in the book Estimating for printers published by the Federation of Master Printers, London.

(k) BUSINESS STATISTICS

Collection and classification of data; use of graphs and diagrams; sampling, quality control etc.

(l) COMMUNICATION

Passing of instructions; preparation for the meetings; writing of business letters; minutes and memoranda; drafting and summarising of reports; public speaking, discussion group and methods; communication with the business unit; joint consultation; students will also be required to undertake projects involving the collection of information on certain aspects of printing management, the classification and analysis of this material and the preparation of written report.

(m) COMPREHENSION AND EXPRESSION

The different techniques of expression. Pitfalls to avoid. How to argue, discuss and persuade.

(n) ECONOMICS

The social frame-work, population, national income industrial frame work, size of firm and problems of size; type of business organisation; theory of price; production and distribution; money and credit; methods of Government finance; General level of prices; export trade.

(o) ELEMENTS OF INDIAN LAW

Equity; law reporting; structure of Indian courts of justice; legal profession; fundamental principles of justice; law of property; law of contract; law of tort with particular reference to law of defamation; copyright; imprint;

(p) FACTORY MANAGEMENT

Objectives; factors influencing the type of organisation; layout of works and offices; choice of site; working conditions; lighting; heating and ventilation; availability of raw materials; determination of processes;

responsibility of overseers and craftsmen; planned maintenance; materials handling; purchasing and stores.

(q) **GENERAL COMMERCIAL KNOWLEDGE**

Commerce in relation to industry; divisions of commerce; buying and selling; documentation; channels of distribution; transport, including shipping, warehousing; insurance; office organisation and methods.

The business unit; sole trader, partnership, joint stock companies state enterprise; commercial and industrial associations; banking and currency of overseas trade.

(r) **HUMAN RELATIONS**

The organisation of the business unit; the working groups; group leadership; individual understanding.

(s) **INTRODUCTION TO WORK STUDY**

Definition and aims, method and time study, divisions of work study, rating, allowances for relaxation, securing standard times, job specifications, flow of charts, process chart, use of models.

(t) **MANAGEMENT ACCOUNTING**

Sources of capital, capital issues, treasury control and issue house practice; investment of capital, trade investments; gilt-edged investment in subsidiary companies; control of current assets, investments, stock, work-in-progress, debit collection, hire purchase, cash discounts; internal auditing; marginal control, charts, budgetary control and forecasting, reports for boards, chief executives, bankers, interim accounting, consolidated accounts, interpretation of accounts.

(u) **PERSONNEL ADMINISTRATION**

Employer-Employee relations, trade unions, joint industrial council; wages and salaries, job evaluation and merit rating; employment policy, selection, placement, transfer, promotion; education and training, induction.

(v) **PRODUCTION PLANNING AND CONTROL**

Forecasting, stages and divisions of planning, degrees of production planning, routing and planning, production schedules, use of statistical methods, material cost control, labour cost control.

(w) **SALESMANSHIP**

The place of selling in commerce, psychological aid to selling, the fundamentals of salesmanship, selling personality, knowledge of sales proposition, knowledge of the market, techniques of salesmanship, various selling methods.

APPENDIX III TO ANNEXURE XII

Examination Scheme

Sl. No.	Subject	Examination		
		Theory	Practical	Sessional
TWO YEAR FULL TIME COURSE				
1.	Book Printing	100	100	..
2.	Composing	100	100	..
3.	Nature of Management Line composition	100	100	..
4.	Letterpress Cylinder & Platen . .	100	100	..
5.	Litho printing	100	100	..
6.	Photo-engraving, Metal Printing, Etching and Camera operating	100	100	50
7.	Design and drawing	100	100	..
8.	Science	100	..	..
9.	Costing	100	..	..
10.	Estimating	100	..	..
11.	Economic aspect of Industry & Commerce	100	..	..
12.	Evolution of Modern Industrial Organisation	100	..	..
13.	Financial accounting and costing . .	100	..	..
SECOND YEAR				
1.	Electro-typing and Stereo typing . .	100	100	..
2.	Mechanics	100	..	..
3.	Letterpress Rotary printing	100	100	..
4.	Mono-type composing	100	100	..
5.	Mono-type casting	100	100	..
6.	Photo gravure printing	100	100	..
7.	Silk Screen	100	100	..
8.	Photo gravure process	100	100	50
9.	Photo-Litho plate making	100	100	..
10.	Photo-mechanical development . .	100	100	..
11.	Costing	100	..	..
12.	Estimating	100	..	..
13.	Financial accounting and Cost accounting	100	..	..
14.	Legal aspects of industry	100	..	..

Sl. No.	Subject	Examination		
		Theory	Practical	Sessional
15.	Office organisation & method	100	100	..
16.	Statistical methods	100	..	..
17.	Work measurement and incentives	100	..	..
18.	Applied Science	100	100	..
19.	Design	100	100	..

THREE YEAR FULL TIME EXAMINATION SCHEME

1.	Book Binding	100	100	..
2.	Composing (Hand) including Ludlow	100	100	..
3.	Line composition	100	100	..
4.	Mono Keyboard	100	100	..
5.	Mono casting	100	100	..
6.	Design	100	100	..
7.	Engineering Drawing . . . . .	..	100	50
8.	Photo-engraving	100	100	..
9.	Letterpress cylinder Platen	100	100	..
10.	Lithography	100	100	..
11.	Science	100	100	..
12.	Costing	100	..	..
13.	Book-keeping	100	..	..
14.	Economic aspect of Industry and Commerce	100	..	..
15.	Evolution of Modern Industrial organisation	100	..	..
16.	Nature of Management	100	..	..
17.	Financial Account and Costing	100	..	..
18.	Estimating	100	..	..

SECOND YEAR

1.	Electro-typing and stereo-typing	100	100	..
2.	Mechanics	100	..	..
3.	Letterpress Rotary printing . . . . .	..	100	..
4.	Mono-key composition	100	100	..
5.	Mono-type Casting	100	100	..
6.	Photogravure process	100	100	..
7.	Photogravure printing	100	100	..

Sl. No.	Subject	Examination		
		Theory	Practical	Sessional
8.	Photo-Litho plate making	100	100	..
9.	Photo-Litho printing	100	100	..
10.	Costing	100	..	..
11.	Estimating	100	..	..
12.	Statistical methods	100	..	..
13.	Work measurements and incentives	100	..	..
14.	Office organisation & methods	100	..	..
15.	Science	100	100	..
16.	Design	100	100	..
THIRD YEAR				
1.	Hand-composition	100	100	..
2.	Maintenance and repair	100	100	..
3.	Photogravure process	100	100	..
4.	Photo-mechanical Developments . . . . .	..	100	..
5.	Process Camera operating	100	100	..
6.	Silk Screen	100	..	..
7.	Costing	100	..	..
8.	Estimating	100	..	..
9.	Factory management	100	..	..
10.	Introduction to workshop	100	..	..
11.	Management Accounting	100	..	..
12.	Personnel Administration	100	..	..
13.	Production Planning and Control	100	..	..
14.	Salesmanship	100	..	..
15.	Design	100	100	..
16.	Science	100	100	..
17.	Photography	100	100	..
18.	Photogravure printing	100	100	..
19.	Letterpress Rotary	100	100	..
20.	Litho-printing	100	100	..

APPENDIX IV TO ANNEXURE XII

Staff

DIRECTOR—Rs. 1800—100—2250

DY. DIRECTOR—Rs. 1600—100—1800

	Rs.
1. Head of the Administrative subjects (Professors)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturer	I 350—850
2. Head of the Book-Binding and Ware house department (Professor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturer	I 350—850
(iii) Instructors	I 300—25—500—30— 560
3. Head of the Composing department (Professor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturers	I 350—850
(iii) Instructors (Hand composing Lino, Mono and Casting)	I 300—25—500—30— 560
4. Head of department of Design (Profes- sor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturer	I 350—850
5. Head of the Graphic Reproduction (Professor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturer	I 350—850
(iii) Instructors	I 300—560
6. Head of the Letterpress and Foundry Department (including photogravure) (Professor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Instructors	I 300—560
7. Head of the Deptt. of the Lithographic printing (Professor)	I 1000—50—1500
(i) Asstt. Professor	I 600—1150
(ii) Lecturer	I 350—850
(iii) Instructor	I 300—560

		Rs.
8. Head of the department of Science and General Education Professor . . .	1	1000—50—1500
(i) Asstt. Professor	1	600—1150
(ii) Lecturer	1	350—850
(iii) Lab. Attendants	3	35—1—50
9. Librarian	1	350—850
Asstt.	1	300—560
10. Head of the Engineering and Electrical department	1	1000—50—1500
(i) Asstt. Professor	1	600—50—1150
(ii) Workshop Superintendent	1	600—50—1150
(iii) Foreman	1	275—15—800
11. Supervisor—Electrical	1	250—10—300
Supervisor—Mechanical	1	250—10—300
12. Mechanics (A)	5	120—8—200
(Electrical & Mechanical) Mechanical (B)	5	80—5—120

OFFICE

13. Accounts Officer	1	400—20—500
14. Stores Officer	1	350—850
15. Auditor	1	200—500
16. Technical Asstt. (Senior)	1	250—500
17. Technical Assistant (Junior)	2	160—330

OTHER STAFF

18. Suptd.	1	400—20—500
19. Junior Suptd.	1	300—20—500
20. Assistant.	2	160—450
21. Stenographers	3	160—10—330
22. Stenotypist	3	60—130+20 spl. pay
23. U.D.C.	4	80—220
24. L.D.C.	12	60—130
25. Accountant	1	200—500
26. Chief Storekeeper	1	100—350
27. Storekeeper	3	80—220
28. Gestetner Operator	1	40—2—50
29. Library Attendant	3	35—1—50
30. Daftry	3	35—1—50
31. Peon	15	30— $\frac{1}{2}$ —35
32. Chokidar	5	30— $\frac{1}{2}$ —35
33. Driver	1	60—75

Research and Information Division

Rs.

Research

1. Asstt. Prof.—Physics	1	600—1150	
2. Asstt. Prof.—Biology	1	600—1160	
3. Asstt. Prof.—Chemistry	1	600—1150	
4. Asstt. Prof.—Metallurgy	1	600—1150	
5. Instructor.			
(i) Letterpress	}		
Lino			
Mono Key Board			
Mono Caster			
Printing			
Binding			
(ii) Lithography		6	300—25—500—30—
Camera			560
Retouching			
Plate-making			
Printing			
(iii) Gravure Retouching and Printing. Etching Printing.			
6. Liaison Officers		3	300—25—500—30—
		560	
7. Lab. Attendants	6	35—1—50	

Information Services.

1. Librarian	1	350—850
2. Asstt. Librarian	1	300—560
3. Technical Asstt. (Senior)	1	250—500
4. Technical Asstt. (Junior)	4	160—330
5. Stenographer	1	160—10—330
6. Steno-typists	1	60—130 + Spl. Pay Rs. 20
7. U.D.C.	12	80—220
8. L.D.C.	14	60—130
9. Typists	3	60—130
10. Library Attendants	3	35—1—50
11. Gestetner Operator	1	40—2—50
12. Pcon	5	30— $\frac{1}{2}$ —35
13. Chokidar	2	30— $\frac{1}{2}$ —35
14. Daftry	2	35—1—50

APPENDIX V TO ANNEXURE XII

Accommodation*Accommodation for the Institute*

	No.	Sft.
Item I—A. Framed Structure		
1. Director's room	1	400
2. Deputy Director's room	1	400
3. Heads of Departments	10	2000
4. Senior Staff . . . . .	..	600
5. Common room . . . . .	..	600
6. Meeting room and Staff room . . . . .	..	1500
7. General Office . . . . .	..	3000
8. Library . . . . .	..	2000
9. Lecture rooms (1000 each)	8	8000
Lecture Hall . . . . .	..	4000
	..	22500
Pius 1/3rd (includes staircase, passage, etc.)	..	7500
		30000

Factory Type

10. *Students Common room . . . . .	..	600
11. Laboratories-Physics, Chemistry & Metallurgy	..	3000
12. Hand Composition . . . . .	..	450
13. Lino Casting . . . . .	..	450
14. Mono Keyboard . . . . .	..	450
15. Mono casting . . . . .	..	450
16. Air Compressor Room . . . . .	..	300
17. Proof Reading Room . . . . .	..	300
18. Pre-make Ready . . . . .	..	1000
19. Type Store including Washing Place . . . . .	..	2500
20. Stereo-typing and Electro-typing . . . . .	..	4000
21. Metal melting . . . . .	..	250
22. Letter Press Printing . . . . .	..	6000
23. Binding including space for printed sheets . . . . .	..	6000
24. Design and layout . . . . .	..	3500
25. Camera Operation Room . . . . .	..	2500

*To be worked out according to scale.

	No.	Sft.
Item I—A. Framed Structure— <i>Contd.</i>		
26. Dark Room—3 @ 400 each	1200
27. Retouching	45 ⁰
28. Plate-making	1500
29. Photo composing and Justo-type	600
30. Offset Printing	6000
31. Store (Chemical)	300
32. Store (Paper)	600
33. Gravure Camera	300
34. Retouching	300
35. Planning & layout	300
36. Carbon Tissue	300
37. Etching	600
38. Copper depositing etc.	1200
39. Gravure Printing	3000
40. Store (Chemical)	300
41. Plant Room for Air Conditioning	1000
42. Workshop	4500
43. Graining	250
44. Photo engraving camera	45 ⁰
45. Dark Rooms 2 @ 300 each.	600
46. Retouching	45 ⁰
47. Etching	45 ⁰
48. Garages 2-300 each.	600
49. Chowkidars etc. @ 350 sft. per person-5.	1750
50. Cycle Stand	1500
51. Caretaker	600
	..	63400
Add 25% for plinth	..	15850
		79,25 ⁰
Say 80,000		80,000
		30,000
		1,10,000 Sft. Plinth.
B. Research		30,000
C. Accommodation for Specialised Course		15,000
		45,000
Total Plinth Area		1,55,000 sft.

	Sft.
Framed Structure	30,000@16/-per Sft. 4,80,000
Factory Type	60,000@12/- per Sft. 9,60,000
Research Unit (Factory type)	30,000@12/- per Sft. 3,60,000
Specialised Courses (factory type)	15,000@12/- per Sft. 1,80,000
	19,80,000

Say Rs. 20.00 Lakhs.

Electric installation, fans and lights 2.22

Air-conditioning 3.00

Rs. 25.22 lakhs.

Say Rs. 25.20 lakhs.

Hostel

	No.	Sft.	Lakhs Rs.
1. Single Seated @ 200 Sft. per student	30	6000	} 33000 6.30
2. Three Seated @ 180 Sft. per student	150	27000	
3. Hostel equipments and furniture for 180 students.			1.00
4. Dispensary with 4 beds			0.25
5. Miscellaneous : For Electric connection, etc.			0.25
			7.80

Say Rs. 8.00 Lakhs.

Staff Quarters

	Rs.
1. Director—1. 3,000 Sft.	35,000
2. Dy. Director—1—3,000 Sft.	35,000
3. Heads of Department—9—20,250 @ 30,000	2,70,000
4. Asstt. Professors and Estate Manager—15.—24,000 @ 25,000	3,75,000
5. Lecturers, Instructors, Foreman, Librarian, Asstt. Lib. 34—47,600 @ 12,000	4,08,000
6. Supervisor, Asstt. Steno. Chief Store Keeper Tech. Asstt. (Junior) 15—11,550 @ 8,000	1,20,000

			Rs.	
7. Mechanics(A) 5	}		52 31,200 @ 8,000	4,16,000
(B) 5				
Steno-typists—3				
U.D.C.—4				
L.D.C.—12				
Store Keepers—3				
8. Gestetner Operator	}		47 16,450 @ 5,000	2,35,000
Lib. Attendant				
Daftry				
Peons				
Chaukidars				
Driver				
<i>Research Unit</i>				
Similar staff				18,94,000
Say. 1.60 lakhs Sft.				

Say Rs. 19 lakhs.

Servant quarters, Lavatory blocks, staircase, etc. included in the plinth area.

ANNEXURE XIII

[Item No. 19C(b)]

COPY OF PUNJAB GOVERNMENT'S LETTER NO. 4476-BRI-61/15535 DATED THE 23RD MAY, 1961, REGARDING CONTINUATION OF CENTRAL ASSISTANCE TO TECHNICAL INSTITUTIONS REGARDING RECURRING EXPENDITURE

Proceedings of the meeting held at Chandigarh on 9-4-59 to consider the question of financing of recurring expenditure for the running of Technical Institutions in the Punjab State covered under the Development Schemes.

With reference to the concluding para of the minutes of the meeting cited as subject, copy sent to you with Punjab Government Memo. No. 5460-BRI-59/8505, dated the 24th/27th April, 1959, I am directed to enclose for the consideration of the Government of India, a detailed note explaining the view point of the State Government for the financing of recurring expenditure deficit for the running of Technical Institutions in the Punjab State already covered under the development scheme during the Third Five Year Plan. It is imperative that the Government of India should continue to give financial assistance to the extent of 1/3rd of the expenditure deficit during the Third Five Year Plan. Further, the State Planning Department have been consulted and they have advised that the pattern of Central Assistance in the Third Five Year Plan would continue to operate till the Planning Commission amends the pattern. I am, therefore, to request that the approval of the Government of India, in the matter may please be obtained and communicated to this State Government at an early date.

Financing of recurring expenditure deficit for the running of Technical Institutions covered under the development scheme.

The question of financing of the annual recurring expenditure deficit of private technical institutions was discussed last in a meeting held at Chandigarh on 9th April, 1959 between the representatives of the Government of India, in the Ministry of Scientific Research and Cultural Affairs, State Government and of the Institutions. The deficit in recurring expenditure for the various non-Government Technical Institutions was to be shared by the Central Government, the State Government and the management of the Institutions on an agreed pattern during the 2nd plan period. The representatives of the non-Government Institutions explained that in case the Central and the State Governments did not at all share any part of the recurring expenditure deficit in the post-second plan period, they would certainly not be able to stand on their own legs for meeting entire recurring expenditure deficit.

2. The recurring expenditure deficit anticipated at the fully developed stage in respect of each Institutions as reported by these institutions is given below :—

- | | |
|--|----------|
| 1. National Institute of Engineering, Hoshiarpur . | 2,12,400 |
| 2. Mehr Chand Polytechnic, Jullundur . . . | 1,84,640 |

3. Ramgarhia Polytechnic, Phagwara	2,91,200
4. Guru Nanak Engineering College, Ludhiana	4,80,000
5. S. D. Polytechnic, Baijnath	1,14,597
6. Thapar Institute of Engineering and Technology, Patiala	6,20,000

In the case of Guru Nanak Engineering College, Ludhiana the management have an assured income of Rs. 1.50 lacs annually from Sheromoni Gurdwara Prabhandak Committee. For the balance they count upon the Central and State Governments to share in the deficit. The Thapar Institute of Engineering & Technology, Patiala are due assistance of Rs. 2.00 lacs per year for the period 1959-60 from the State Government towards recurring expenditure. This Institution has asked for an increase in the State share to Rs. 3.00 lacs. The remaining Institutions have expressed their inability to bear the entire recurring expenditure deficit in the post 2nd plan period.

3. The representative of the Central Government had pointed out that the matter had been taken up with the Planning Commission but within the limited scope of the rough cost out-line of the Third Plan for the Sub-head "Technical Education," it would only be possible for the Central Government to provide their 50% share in the non-recurring expenditure on the establishment of three new Polytechnics in the Punjab State and 50% of the recurring expenditure involved therein for the next five years and also the spill over of the Central Government committed share on the Development/Expansion of other Government Technical Institutions in the State during the Third Plan period. Besides this the Central Government had decided to meet the expenditure on the improvement of salary scales of the teaching staff at all technical Institutions to a uniform all India level for the period of five years. Beyond this, the Central Government were in a position to meet any recurring expenditure for the non-Government or Government technical institution in the 3rd plan. The representative of the Central Government had suggested that the State Government should consider assisting the non-Government Institutions in meeting their recurring expenditure. For this, he suggested the pattern followed in the Bombay State according to which the management of the non-Government Institutions should be required to bear 50% of the gross recurring expenditure or the net recurring deficit after accounting for the income from fees etc., whichever happens to be less. He stressed that the non-Government Institutions having been set up through collective effort incurring such huge expenditure cannot be allowed to die out or fail into decadence. It is well known that the net recurring deficit of a degree College with an intake of 240 for a 4 year course is of the order of about Rs. 10.00 lakhs and in the case of a Polytechnic with an intake of 240 of the order of Rs. 5 to 6 lakhs. For an intake of 120 students the order of deficit in recurring expenditure would be Rs. 4 to 5 lacs in the case of degree College and Rs. 1.75 to 2.00 lacs in the case of a Polytechnic. The financial position of the State Government would not permit of entertaining such a heavy liability for technical institutions, in Punjab. It was, therefore, urged that the Central Government may continue to share the recurring deficit as in the Second Five Year Plan. After discussion it was decided that State Government should forward a note to the Government of India explaining the State point of view for their consideration.

5. A very rough estimate of deficit on the basis of latest standard received from the Government of India as worked out in this office and provided in the 3rd Plan is as follows :—

Name of the Institution	Total Deficit	Institution Share 1/3rd	Balance
1. Mehr Chand Polytechnic, Julundur	1,48,710	49,570	99,140
2. Ramgarhia Polytechnic, Phagwara	1,81,600	60,533	1,21,067
3. S. D. Polytechnic, Baijnath	77,150	25,717	51,433
4. Guru Nanak Engineering College, Ludhiana	5,77,800	1,92,600	3,85,200
TOTAL	9,85,260	3,28,420	6,56,840
5. Thapar Institute of Engineering & Technology, Patiala (Payable by the State Government @Rs. 2.00 lacs per year as per donorship agreement)			2,00,000
			8,56,840

Total for 5 years 8,56,840 × 5 = 42,84,200

Or say—42.00 lacs.

The Third Five Year Plan for Technical Education includes a provision of Rs. 42 lacs for assistance to these private institutions on the assumption that the Government of India, will continue to give assistance on the 2nd Five Year Plan pattern during 3rd plan period.

6. It is, therefore, requested that Central Government may continue to meet a part of the recurring expenditure deficit of non-Government institutions developed with their aid in the first and 2nd plan period on the pattern followed in the 2nd plan period.

ANNEXURE XIV

(Item No. 22)

Third Five year Plan of Technical Education outlay on Schemes in the Central Sector

S.No.	Scheme	Outlay 1961-66 (Revised provision on the basis of programme limit)
		Rs. in crores
1.	Development of Delhi Polytechnic	0.5
2.	I.I.T., Kharagpur	} 19.02
3.	I.I.T., Madras, Bombay & Kanpur	
4.	Indian School of Mines, Dhanbad	0.75
5.	College of Engg. & Tech., Delhi	2.50
6.	Practical Training Stipends and Hostels	0.82
7.	Research Training Scholarships and Fellowships	0.20
8.	Teachers Training Fellowships and Hostels	1.43
9.	Regional Engineering Colleges, sanctioned in the 2nd Plan	8.00
10.	Development of non-Government Institutions	3.00
11.	Revision of salary scales of teachers	5.00
12.	Loans for the construction of hostels	6.00
13.	Post-graduate courses and research	2.50
14.	Expansion of facilities initiated in the 2nd Plan (non-Govt. institutions)	2.00
15.	Introduction of 5 year integrated course in non-Government Colleges	0.75
16.	Scholarships	3.23
17.	Staff quarters . . . . .	..
18.	Development of facilities in special subjects (including correspondence courses)	4.50
19.	Seven additional Regional Engineering Colleges and expansion of Non-Government Institutions in 3rd Plan	5.00

S.No.	Scheme	Outlay 1961-66 (Revised provision on the basis of programme limit)
		Rs. in crores.
20.	Increase in price and replacement of obsolete equipment in non-Government Institutions .	1.00
21.	Strengthening of Technical staff at the Headquarters & Regional Offices	0.12
22.	Grants to U.G.C. for spill over	1.68
23.	Central Assistance to new non-Government Institutions to be established	2.00
GRAND TOTAL .		70.00

ANNEXURE XV

(Item No. 22)

Technical Education & Training of Women Establishments of Technical Schools and Polytechnics for Girls

The Problem

The problems of women's education and particularly of girls at the primary, middle and secondary stages have been examined in detail by the National Committee on Women's Education which has submitted a comprehensive report on the subject in 1958. Therefore, it is hardly necessary at this stage to go over the whole ground again. Nevertheless, it is necessary to emphasize the significance of certain findings of the Committee in the present context, *viz.*, Technical Education and Vocational Training of girls.

The Committee has observed that on the basis of 1956-57 statistics, only 34·7% of girls in the age group 6-11 go to school as against 73·8% for boys in the same age group. In the age group 11-14 the number of girls attending the middle school is only 8·5% as against 28·7% for boys. In the age group 14-17, the percentage of girls at school is 3·4 as against 15 for boys. These figures reveal that educational facilities at the middle and secondary stages notwithstanding, a majority of girls completing primary education upto 11 do not continue their education. The proportion of girls who go upto secondary and further stages of education falls down very sharply. It is doubtful that free compulsory education for all children upto 14 will be made available in the near future. Even more so is it at the secondary education stage. Even if it were otherwise, a large proportion of girls give up schooling progressively at the middle and secondary stages, either due to social or to economic reasons or both.

The important question that arises out of this situation is what opportunities of training should be provided to girls of these age group so that when they grow up they might find gainful occupation outside their houses? How can they be trained to become productive members of the community without looking on marriage as a secure career?

In this connection the study carried out by the Labour Bureau in collaboration with the Planning Commission on the pattern and trends of employment of women is of interest. The main conclusions arrived at by the Bureau are as follows:—

- (1) On the basis of an international comparison of women's employment, it may be stated that with the rising tempo of industrialisation in the country and the consequent development of trade, commerce and social services, the number of women workers is bound to increase and this number will specially increase in the tertiary sector of the economy. Moreover, the changes which are taking place in our social attitude would help accelerate women's employment in all spheres of the economy. We see an increasing number of women employed in private and public offices in different kinds of services.

- (2) At present the percentages of women engaged in industry and services are 7 and 11.4 respectively. These participation rates are most likely to increase and the professional and technically trained women will have a larger share among their total numbers.
- (3) The more recent trend in industrial growth has been the establishment of medium-sized units and it is hoped that in such units there will be sufficient opportunities for employment of women.

The National Committee on Women's Education has also pointed out the existing difficulties in the vocational training of girls. "Vocational education for girls and women to equip them for taking up specific occupations is relatively a new concept in our country. It is a matter of comparatively recent development even in the West. The problem of devising suitable courses in vocational education in this country is a difficult and complex one. Difficulties arise because the existing system of general education has been carried on for generations with little regard to the needs of industry and commerce. The main object so far has been to secure literary education. Complexities exist because of the lack of coordination between training facilities and requirements of the country. The training facilities for vocational education are also inadequate and as such the number of girls and women taking up vocational education is extremely small and compares poorly with that of boys and men." The International Labour Organisation has made a useful study of these problems and has submitted to the Central Government a report on the condition of women's work in seven Asian countries including India. It has made the following recommendations:

- (i) The governments concerned should undertake systematic survey of vocational training needs and opportunities for girls and women.
- (ii) The appropriate authorities should analyse the use made by girls and women of the existing training facilities in an effort to determine the factors which limit access by girls and women to all types of facilities and to encourage wider use by them of all types of facilities.
- (iii) That on these basis the appropriate authorities should formulate plans and programmes for the training of girls and women which would *inter alia*
 - (a) promote the vocational training needed to develop earning skill outside the home;
 - (b) extend training opportunities for women for industrial, commercial and public service occupations in accordance with the developing needs of each national economy;
 - (c) promote awareness of new opportunities and needs for women workers in such fields as social welfare, nursing, chemical and pharmaceutical employment and office work and of occupational shortage areas for which women might be trained; and
 - (d) increase and variegate vocational training opportunities in village centres and in rural areas generally.

Integrated Scheme

In formulating plans for the technical and vocational education of girls we should take an integrated view of the requirements of girls in the entire age range 11 to 17. Such an integrated view is the more necessary since facilities have to be provided to girls at three distinct age levels *viz.* 11, 14 and 17 at which large numbers of them give up schooling. They should be diverted to different forms of technical and vocational education that are designed specially to suit their age groups and general educational level. A comprehensive technical institute established for girls should therefore offer three different and self-contained cycles of technical and vocational training, as shown below:

- (a) *Primary Cycle* for the age group 11, extending over a period of four years and terminating at the age of 15.
- (b) *Secondary Cycle* for the age group 14, extending over a period of three years and terminating at the age of 17.
- (c) *Tertiary Cycle* for the age group 16 or 17, extending over a period of 2-3 years. The terminating age for this cycle would be 18 to 20 depending upon the duration of the courses taken and age of entry.

The duration of these three cycles is determined by various factors *viz.*, the fields of training, the nature and scope of training, development of skills and knowledge of the fields upto an adequate level, the maturity of the girls to absorb the training etc.

Fields of Training & Scope

The fields of training to be provided in each cycle should be related to the corresponding age group. Their choice should be such that opportunities of gainful employment would be available to a girl who has completed the prescribed course of training. Also, the range of the subjects should be as wide as possible in order that the training may cater for girls of different aptitudes and interests.

The duality of Technical or Vocational education and General education is important at least in the Primary and Secondary cycles. Only because a girl gives up normal schooling at 11 or 14 and goes for Technical training is no reason why her general education should not continue as an integral part of the Technical training. In fact, it is necessary that it should continue to ensure that the total personality of the girl is developed in an integrated manner.

With these considerations kept in view, a scheme of Technical and Vocational Training covering all the three cycles has been drawn up and is given at Annexure I. The fields of training provided are generally common to the Primary and Secondary cycles. A higher degree of skill or technical attainment, however, has to be aimed at in the Secondary cycle which caters for girls in a higher age group. Nevertheless, after completing the Primary cycle a girl may undergo further training for a year in the Secondary cycle and attain higher proficiency in her chosen field.

The Tertiary cycle represents the conventional professional training at the post-matriculation stage. The fields of training chosen are such that training in them could be given to those who have had general education of matriculation standard. The duration of the courses is generally two to three years depending upon the field of training selected by a candidate.

For some of the fields, the courses are fairly well standardised by the All India Council for Technical Education, the Pharmacy Council of India and other bodies and are being offered by technical institutions of the polytechnic type. Additional fields may be added in due course depending upon their occupational importance to women and after the standard and content of training in them have been standardised by the All India Council for Technical Education or any other recognised organisation.

The curriculum for the Primary and Secondary cycles has also been drawn up and is given in the annexure. In the former, general education occupies about 40% of the total time, the rest being allotted to technical training. The quantum of general education varies from year to year 50% of the total time available in the first two years and gradually reducing to about 40% and 30% in the last two years respectively. Correspondingly, the quantum of technical training increases gradually from the first two years of the course to the last two. A similar arrangement is proposed in the Secondary cycle. The idea is that there should be a gradual build-up of technical or vocational competence in the chosen field along with general educational development of the students.

Organisational Aspects

Although technical institutions for girls have been in existence for a long time elsewhere in the world, such institutions are being established for the first time in India. Therefore, it is necessary to make a small beginning with this scheme of training at selected centres and develop it gradually. An experimental approach is desirable and on the basis of the experience gained, the scope and standard of training should be modified.

From the point of view of both economy and efficiency, it is desirable to establish an integrated institution that could offer all the three cycles of training for girls in the age groups of 11, 14 and 16 or 17. That will also facilitate the efforts of some girls who have completed one cycle to have advanced training in their chosen fields in the next higher cycle. Nevertheless, should it become necessary to establish separate institutions for girls of different age groups, the best arrangement would be to have an institution exclusively for the tertiary cycle and another institution for the Primary and Secondary Cycles. The former may be called Polytechnic for Women and the latter Junior Technical School for Girls.

The Primary and Secondary cycles include 12 common fields of training; the Tertiary cycle includes 10 fields. An important question that arises is, how many fields should an institution offer and what is a reasonable number of students to be admitted to each? A precise answer to this question cannot be given at this stage, since conditions vary from one part of the country to another and various practical considerations have to be taken into account in respect of each institution. Nevertheless, about 30-40 students may be regarded generally as an optimum admission to each course. At an integrated institution offering all the three cycles, the number of classes each with 30-40 students will be 114 if all the fields of training included in this scheme are taken into account. The student enrolment will be of the order of about 3420-4560. Obviously, an institution of such a large size cannot be established and run on satisfactory lines, at least at this stage. For practical reasons therefore, the number of fields to be offered has to be restricted. Also, at the same institution, the interests of the prospective students may not lie over the whole range of fields included in the scheme.

In view of the above considerations, the most practicable size of an integrated institution should be for a student enrolment of not exceeding 900-1000. That will correspond to three selected fields being offered in each cycle.

If a separate technical school is established for the Primary and Secondary Cycles, its size may be for a student enrolment of about 630 that would correspond to three fields being offered in each cycle. For a separate polytechnic a student enrolment of 600 may be regarded as a reasonable size. That will enable the institution to offer about six fields of training with a total annual admission of about 200 students.

These are purely indicative of practicable sizes that might be considered in the initial stages of the scheme. Later on, depending upon the demand felt at each centre for the training facilities, the varied interests of the students in respect of fields of training and the organisational and administrative arrangements that could be made, the institutions may be enlarged. By then, sufficient experience would have also been gained with the scheme that will help in deciding the further development of the institutions on correct lines.

Should the institutions be residential, partly or fully? That would depend on the conditions obtaining at each centre and has to be decided in accordance with the local requirements. For purposes of present estimates, however, provision may be made for hostel accommodation to be provided for about 25% of the students at each institutions. The hostels should be in accordance with the usual standards prescribed by the Central Government.

No tuition fees should be charged and provision should be made for the award of scholarships of a suitable value to at least about 25% of the students. The value may be :

Rs. 25 P.M. for students in the Primary Cycle.

Rs. 30 P.M. for students in the Secondary Cycle.

Rs. 50 P.M. for students in the Tertiary Cycle.

Estimates of Cost

Tentative estimates of cost of an Integrated Institution, of a Technical School exclusively for the Primary and Secondary Cycles and of a Polytechnic exclusively for the Tertiary cycle are given in the Annexure. In preparing these estimates the general Principles regarding the sizes of the institutions as indicated in the preceding paras have been kept in view. A summary of these estimates is given below :

Type of Institution	Estimates of Cost			(Rs. in lacs)	
	Build-ings	Equipment furniture Library	Total Non-recurring	Recurring	Hostels
A. Integrated Institution for All the Three cycles	7.0	9.0	16.0	7.2	6.25
B. Polytechnic for Women	5.0	6.0	11.0	6.0	3.75
C. Technical Schools for Girls	4.4	5.0	9.4	3.8	3.75

PRIMARY CYCLE

Age Groups :—II (Duration Four years)

Terminal Age : 15

General Education Subjects : *Technical Education & Training* :

- | | |
|--|---|
| <p>(a) Languages.</p> <p>(b) History, Geography & Civics.</p> <p>(c) General Science and Mathematics.</p> <p>(d) Home Science.</p> | <p>(a) <i>Art Group</i> :</p> <p>Drawing & Sketching
Clay Modelling
Composition
Lettering & Sign-writing.</p> <p>(b) <i>Commerce Group</i> :</p> <p>Short-hand & Typewriting
Elementary secretarial practice.</p> <p>(c) <i>Crafts Group</i> :</p> <p>(i) Costume Design and Dress Making
(ii) Pottery.
(iii) Textile including Design, Printing & Finishing.
(iv) Wood Carving & Patterns making.
(v) Engraving & Enamelling.
(vi) Metal craft & Shape making.
(vii) Bookbinding & Pamphletbinding.</p> <p>(d) <i>Food Industry Group</i> :</p> <p>Bakery & Confectionery .
Food preservation.</p> <p>(e) <i>Engineering Trades Group</i> :</p> <p>(i) Telephone Service PBX & Telegraphy.
(ii) <i>Light engineering Work</i> :</p> <p style="padding-left: 2em;">Assembly of machines; fitting; turning and milling of components. Electrical wiring of electrical machines and appliances.</p> |
|--|---|

(Instruction in the Technical subjects is not exclusively practical but includes theory wherever necessary. Each instruction in a particular group includes instruction in certain associated subjects that are necessary for the group or any of its fields. As for instance, Engineering Drawing will be an associated subject for the Engineering Trade Group; additional instruction in Languages for the Commerce Group; and so on.)

SECONDARY CYCLE

Age Group :—14 (Duration 3 years)

Terminal Age : 17

General Education subjects : *Technical Education & Training* :

- | | |
|---|---|
| <p>(a) Languages & Humanities.</p> <p>(b) General Science & Mathematics.</p> <p>(c) Home Science.</p> | <p>(a) <i>Art Group</i> :</p> <p>Drawing & Sketching.</p> <p>Clay Modelling.</p> <p>Composition.</p> <p>Commercial Art</p> <p style="text-align: center;">OR</p> <p>Graphic Art Production & Layout.</p> <p>(b) <i>Commerce Group</i> :</p> <p>Short-hand & Typewriting.</p> <p>Business correspondence.</p> <p>Secretarial practice.</p> <p>(c) <i>Crafts Group</i> :</p> <p>(i) Costume Design & Dress Making.</p> <p>(ii) Pottery.</p> <p>(iii) Textiles including Design, Printing & finishing.</p> <p>(iv) Wood carving and Pattern making.</p> <p>(v) Engraving & Enamelling.</p> <p>(vi) Metalcraft & Shape making.</p> <p>(vii) Bookbinding & Pamphletbinding.</p> <p>(d) <i>Food Industry Group</i> :</p> <p>Bakery & Confectionery.</p> <p>Food preservation.</p> <p>(e) <i>Engineering Trade Group</i> :</p> <p>(i) Telephone Service & PBX & Telegraphy.</p> <p>(ii) <i>Light Engineering Work</i> :</p> <p>Assembly of machines; fitting; turning and milling of components.</p> <p>Electrical wiring of electrical machines and appliances.</p> <p>Scientific instruments repair & maintenance.</p> |
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TERTIARY CYCLE

Age Group :—16 or 17 (Duration 2-3 years)

Terminal Age : 18 to 20 depending upon the duration of the course taken and age of entry.

*Fields of Training**Other details*

1. Electronics . . . The admission requirement is a pass in Matric or H.S.S.C. in the Science Group. The duration of the course is three years. Candidates who have completed the Secondary Cycle in the Engineering Trades Group may also be admitted, but they might be required to take additional instruction in science and mathematics either before or during the course.
2. Pharmacy . . . The Admission requirement is a pass in Matric or H.S.S.C. in the Science Group. The duration of the course will be 2-3 years depending upon the statutory rules prescribed by the Pharmacy Council of India.
3. Stenography & Secretarial Practice including Business Correspondence. The admission requirement is a pass in S.S.L.C. or H.S.S.C. The duration of the course is two years. Candidates who have completed the Secondary Cycle in the Commerce Group may also be admitted but for an advanced course of one year in this field.
4. Architectural Draughtsmanship. The admission requirement is a pass in S.S.L.C. or H.S.S.C. The duration of the course is two years. Candidates who have passed the Secondary cycle in the Art Group may also be admitted.
5. Civil Engineering Draughtsmanship. Ditto.
6. Costume Design & Dress making. The admission requirement is a pass in S.S.L.C. or H.S.S.C. The duration of the course is three years. Candidates who have passed the Secondary Cycle in this group may also be admitted for an advanced course of one year.
7. Commercial Art . . . The admission requirement is a pass in S. S. L. C. or H. S. S. C. The duration of the course is three years. Candidates who have completed the Secondary Cycle in the Art Group may also be admitted for one year advanced course in this field.
8. Medical Laboratory Technology. The admission requirement is a pass in S.S.L.C. or H.S.S.C. in the Science subjects. The duration of the Course is three years.
9. Institutional Management. The admission requirement is a pass in S.S.L.C. or H.S.S.C. The duration of the course is 3 years.
10. Library Science . . . Ditto.

In course of time, other fields of training may be added depending upon the occupational importance for women. The choice should, however, be made on the basis that the fields concerned have both academic and practical content and are fit to be offered at post-secondary stage.

The courses in the above fields should lead to the award of Diploma to candidates who complete the prescribed courses satisfactorily.

CURRICULUM

Primary Cycle

Subjects	First year	Second year	Third year	Fourth year
	40 weeks; 30 hours/ week. Total: 1200 hours	40 weeks; 30 hours per week. Total: 1200 hours	40 weeks; 34 hours per week. Total: 1360 hours	42 weeks; 40 hours per week. Total: 1680 hours
1. Languages . . .	120	120	120	120
2. History, Geography & Civics	120	120	120	120
3. General Science and Mathematics	280	280	240	160
4. Home Science . . .	80	80	80	80
5. Technical Training including Theory wherever necessary .	600	600	800	1200

Secondary Cycle

Subjects	First year	Second year	Third year	Total
	40 weeks; 34 hours per week. Total: 1360 hours	40 weeks; 40 hours per week. Total: 1600 hours	42 weeks; 40 hours per week. Total: 1680 hours	
(a) Languages & Hu- manities	200	240	240	680
(b) General Science and Mathematics	320	360	320	1000
(c) Home Science . .	120	120	..	240
(d) Technical Subjects (including Theory wherever necessary) .	720	880	120	2720

Tertiary Cycle

The curriculum has to be formulated separately for each course. For some courses, however, as for instance, Electronics, Pharmacy, Architectural and Civil Draughtsmanship, Medical Laboratory Technology etc., the details have been formulated by the All India Council for Technical Education, Pharmacy Council of India, Ministry of Health & other organisations. These may be followed as such with minor modifications if necessary.

ESTIMATES OF COST

I. Integrated Institute for Age Groups

11+ 14+ & 16/17+

Number of courses in each cycle	Three
Annual admission	270
Total student enrolment	900-1000

Non-Recurring

(a) Main Institute Buildings

Administration	3000 sq. ft.
Class room : 12 × 600	7200 sq. ft.
Museum & Display Room	1000 sq. ft.
Library & Reading Room and Students Common Room	4000 sq. ft.
Physics & Chemistry and Home Science Laboratories	4000 sq. ft.
Teachers' Common Room & Miscellaneous	2000 sq. ft.
Total carpet area	21200 sq. ft.
<i>Add 40% for walls passages, lavatories etc.</i>	<i>8500 sq. ft.</i>
Total plinth area	30000 sq. ft.

Cost @ Rs. 12 sq. ft. inclusive of electrical and water & sewage services Rs. 3.60 lacs

(b) Training shops including Drawing Halls, Studies etc. wherever necessary & stores 30000 sq. ft.

Cost @Rs. 10 sq. ft. inclusive of services Rs. 3.0 lacs

(c) Special fittings & fixtures & Miscellaneous Rs. 0.40 lacs

Total cost of buildings Rs. 7.0 lacs

(d) Equipment & furniture & Library Rs. 9.0 lacs

Total non-recurring cost Rs. 16.0 lacs

Recurring

(a) Staff

Scale of salary

1. Principal	1	Rs. 600—1,000
2. Heads of Technical Departments	6	Rs. 350—850 plus a special pay of Rs. 150 p.m.

3. Lecturers	9	Rs. 350—850
4. Assistant Lecturers and Senior Instructors	12	Rs. 300—560
5. Instructors	15	Rs. 200—450
6. Skilled Assistants	12	Rs. 80—150
7. Office Head Clerk	1	Rs. 200—450
8. Librarian	1	Rs. 150—300
9. Clerks, typists storekeepers etc.	10	Rs. 60—150
10. Peons, Watchmen, Sweepers etc.	10	Rs. 30—60
Annual Staff salary inclu- sive of allowances, Provi- dent fund etc.		Rs. 3·8 lacs
(b) Maintenance, stores and materials, water, electricity, postage, stationery etc. & Miscellaneous		Rs. 1·5 lacs
(c) Stipends & Scholarships		Rs. 1·9 lacs
Total Recurring		Rs. 7·2 lacs
<i>Hostels</i> : For 250 students @ Rs. 2,500 students on an average		Rs. 6·25 lacs

II Polytechnic Institutions for Age Group 16/17+

Number of courses	6
Annual Admission	200 students.
Total student enrolment	600

Non-Recurring

(a) Main Buildings	
Administration	2000 sq. ft.
Class Rooms 8 × 600.	4800 sq. ft.
Library & Reading Room & Students' Common Room.	2500 sq. ft.
Museum & Display Room	1000 sq. ft.
Staff Room & Miscellaneous	1700 sq. ft.
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	12000 sq. ft.
Add 40% for walls, passages, lava- tories etc.	4800 sq. ft.
	<hr/>
	16,800 sq. ft.

Cost @ Rs. 12 sq. ft. inclusive of services	Rs. 2.016 lacs
(b) Training shops including Drawing Halls, Studies, Laboratories etc. wherever necessary	25000 sq. ft.
Cost @ Rs. 10 sq. ft. inclusive of services	Rs. 2.5 lacs
(c) Special fittings, fixtures etc.	Rs. 50,000
Total cost of building	Rs. 5.0 lacs
(d) Equipment, Furniture & Library	Rs. 6.0 lacs
Total non-recurring cost	Rs. 11.0 lacs

Recurring

(a) Staff	
1. Principal	1 Rs. 600—1,000
2. Heads of Technical Department	6 Rs. 350—850 <i>plus</i> a special pay of Rs. 150.
3. Lecturers	6 Rs. 350—850
4. Assistant Lecturers & Senior Instructors	15 Rs. 300—560
5. Instructors	12 Rs. 200—450
6. Skilled Assistants	8 Rs. 80—150
7. Office Head Clerk	1 Rs. 200—450
8. Librarian	1 Rs. 150—300
9. Clerks, Typists, Store-keepers etc.	10 Rs. 60—150
10. Peons, Watchmen, Sweepers etc.	8 Rs. 30—60
Annual staff salary inclusive of allowances, Provident fund etc.	Rs. 3.46 lacs
(b) Maintenance, Stores & Materials, Water, Electricity, Postage, Stationery and Miscellaneous	Rs. 1.5 lacs
(c) Stipends & Scholarships	Rs. 1.0 lacs
Total recurring	Rs. 5.96 lacs or say 6.0 lacs.
<i>Hostels</i> : For 150 students	Rs. 3.75 lacs

III. Technical School For Girls for Age Groups 11+ & 14+

Number of courses in each cycle	Three
Annual admission	180 students
Total Student Enrolment	630

Non-Recurring

(a) Main Buildings :

Administration	2000 sq. ft.
Class Rooms 8 × 600	4800 sq. ft.
Library & Reading Room and Students Common Room	2500 sq. ft.
Museum & Display Room	1000 sq. ft.
Staff Room & Miscellaneous	1500 sq. ft.
	<hr/>
	11,800 sq. ft.

Add 40% for walls, passages, lavatories etc.	4,720 sq. ft.
	<hr/>
	16,520 sq. ft.

Cost @ Rs. 12 sq. ft. inclusive of services. Rs. 2.0 lacs approx.

(b) Training shops including laboratories, drawing halls, studies etc, wherever necessary	20,000 sq. ft.
Cost @ Rs. 10 per sq. ft. inclusive of services	Rs. 2.0 lacs

(c) Special fittings, fixtures etc.	Rs. 0.40 lacs
Total cost of Buildings	Rs. 4.4 lacs

(d) Equipment, Furniture, Library etc.	Rs. 5.0 lacs
Total Non-Recurring	Rs. 9.4 lacs or say Rs. 9.5 lacs approx.

Recurring

(a) Staff

1. Principal	1	Rs. 350—850 <i>plus</i> a special pay of Rs. 150.
2. Lecturers & Heads of Technical Departments.	3	Rs. 350—850
3. Assistant Lecturers & Senior Instructors	9	Rs. 300—560
4. Instructors	15	Rs. 200—450
5. Skilled Assistants	10	Rs. 80—150
6. Librarian	1	Rs. 150—300
7. Office Head Clerk	1	Rs. 200—450
8. Clerks, Typists, Store-keepers etc.	8	Rs. 60—150
9. Peons, Watchmen, Sweepers etc.	8	Rs. 30—60
Annual staff salary inclusive of allowances, provident fund etc.		Rs. 2.3 lacs

(b) Maintenance, Stores & Materials, water, Electricity, Postage, Stationery & Miscellaneous	Rs. 1.0 lacs
(c) Stipends & Scholarships	Rs. 0.52 lacs
Total Recurring per year	Rs. 3.82 lacs or say Rs. 3.8 lacs approx.
<i>Hostels</i> : For 150 students	Rs. 3.75 lacs

NOTE.—In the above estimates, the scales of salary suggested for Heads of Technical Departments are Rs. 350—850 *plus* a special pay of Rs. 150 p.m. at institutions conducting courses in the Tertiary cycle. If well qualified and experienced persons are not available on these scales, the terms would have to be revised and made more attractive. The estimates of recurring expenditure also have to be revised, correspondingly.

ANNEXURE XVI

(Item No. 24)

Scheme of Four Year Integrated Course for the First Degree in Pharmacy

<i>Working Days per year</i>	. . .	200
<i>Working Hours per day</i>	. . .	6
<i>Working Hours per Week</i>	. . .	36
<i>Working Hours per year</i>	. . .	1,200

Sl. No.	Subject	Theory No. of Hrs.	Practical No. of Hrs.	Tutorial No. of Hrs.
1	2	3	4	5
FIRST YEAR				
1.1a.	Biology I or.	2	2	..
1.1b.	Mathematics I	2	..	1
1.2.	Biology II	2	4	..
1.3.	Mathematics II	2	..	1
1.4.	Physics	2	4	1
1.5.	General Chemistry	2	6	2
1.6.	Humanities & Languages	2	..	1
1.7.	Engineering Drawing	..	3	..
TOTAL		12	19 or 17	5 or 6
SECOND YEAR				
2.1.	Humanities & Languages	2	..	..
2.2.	Engineering Mechanics	2	..	..
2.3.	Engineering Drawing	..	4	..
2.4.	Human Anatomy & Physiology	2	4	..
2.5a.	Organic Chemistry	2	3	1
2.5b.	Physical Chemistry	2	3	1
2.6.	Analytical Chemistry	1	6	..
2.7.	Physics	1	3	..
TOTAL		12	22	2
THIRD YEAR				
3.1a.	Pharmaceutical Chemistry I	2	6	..
3.1b.	Applied Biochemistry	1	3	..
3.2.	Preparative Pharmacy	1	6	..

1	2	3	4	5
3·3.	Dispensing Pharmacy . . .	2	4	..
3·4.	Forensic Pharmacy . . .	1	..	..
3·5.	Pharmacognosy I . . .	2	2	..
3·6.	Microbiology . . .	1	2	..
3·7.	Pharmaceutical Engineering .	2	..	1
TOTAL .		12	23	1

FOURTH YEAR

4·1.	Pharmaceutical Chemistry II	2	6	..
4·2.	Pharmaceutical Chemistry III Analytical . . .	1	3	..
4·3.	Pharmaceutical Engineering II	2	3	..
4·4.	Pharmaceutical Preparations .	1	6	..
4·5.	Pharmacology & Bioassay .	3	4	..
4·6.	Pharmacognosy II . . .	1	2	..
4·7.	Principles of Hospital and Industrial Management including elementary accountancy . . .	2	..	..
TOTAL .		12	24	..

Examination Scheme for B. Pharm. Degree

1. There shall be a University examination at the end of each year both in theory and practice on the subjects which are completed during the year.

2. For every subject (theoretical and practical) 30% of the total marks shall be allotted for the Sessional Work. The sessional marks should be recorded within 15 days of the assessment of students' work.

3. For passing the examination a candidate shall be required to obtain 40% in each subject (theoretical and practical taken separately) with an overall aggregate of 50%.

4. Practical examination shall include *viva voce*.

1.1a BIOLOGY—I

A. *Botany*.—The general structure of a typical plant cell, its important inclusions with special reference to various types of food materials and their microchemical tests. The structure and functions of some important plant tissues like parenchyma, sclerenchyma, xylem, phloem, etc.

The general structure, comparative physiology and general life history of *Spirogyra* and *Mucor*, *Penicillium*, *Sancharomyces*, and *Claviceps*.

The general morphology of common stem, root, leaf, flower, and fruit. Basic idea of pollination and fertilization leading to the formation of seeds. Dispersal of fruits and seeds. Germination of seeds.

B. *Zoology*.—The structure and functions of the cell. Cell division. The structure and functions of animal tissues (general structure only).

Nomenclature and classification of animals. Structure and physiology of *Amoeba* and *Euglena* and their life histories. General structure and life history of mosquito, house fly, bed bug, and cockroach. Insects in relation to man and crops; control of insect pests. Life history of silk worm.

General structure of fishes and their culture. General structure of lizards, snakes and birds. General characteristics of mammals; their different types.

A detailed study of the skeletal, digestive, circulatory, respiratory, excretory, nervous and reproductive systems of frog.

C. *Biology of the Human Body*.—General structure of the human body. Blood circulation, respiration, excretion. Foods and their digestion; balanced diet, stimulants and narcotics. Diabetes and insulin. Nervous system and sense organs. Hormones and growth.

Personal and social hygiene, Sanitation.

Practical

(A) The description (excluding identification) of plants or parts of plants mentioned in the theory above.

Collection of the local medicinal plants and their preservation.

(B) The dissection, microscopical examination and description (excluding identification) of various systems of frog.

The dissection, microscopical examination and description (excluding identification) of parts of animals mentioned in theory. At least one mammal and mouth parts of cockroach will be studied in detail. The study of gross indentification of slides of *Amoeba*.

(C) The study of gross anatomy of body.

Books Recommended.—Mangham and Hockley; *Biology for Pharmaceutical Student*. Parker and Bhatia; *Testbook of Zoology for Indian Students Small: A Textbook of Botany for Medical and Pharmaceutical students*.

1.2. BIOLOGY—II

(A) *Botany*.—Anatomy of normal monocot and dicot stem and root and a typical bifacial leaf. Central idea about normal secondary growth in dicot stem. Detailed study of cell structure and tissues.

The general classification of plants. The study of the diagnostic characteristics of the following families of flowering plants with emphasis on plants of medicinal or economic value:

1. Apocyanaceae; 2. Cruciferae; 3. Labiatae; 4. Leguminosae;
5. Liliaceae; 6. Malvaceae; 7. Papaveraceae; 8. Ranunculaceae; 9. Rubiaceae; 10. Rutaceae; 11. Solanaceae; 12. Umbelliferae.

Preparation and Preservation of herbarium sheets and their importance in identification work.

Plant Physiology including the principles of water absorption transpiration, assimilation, respiration, growth and movement in plants.

(B) *Zoology*.—General morphology and life history of the internal parasites of man including Entamoeba, Trypanosoma, Malarial parasite (Plasmodium), Schistosoma, Taenia, Ascaris, Oxyuris and Anclaystoma.

General structure and physiology of vertebrates as illustrated by Lepus.

(C) A comparative knowledge of Human Anatomy through the study of lower animal forms; Dogfish, the frog, the rabbit and the cat.

General structure of brain, heart, and urogenital organs of primates with special reference to Homo sapiens.

Practical

(A) The dissection, microscopical examination and description (exclusive of identification) of parts of plants (roots, stems, leaves, flowers, fruits, buds, etc.) representative of the families studied in the theory.

Preparation of at least 10 herbarium sheets.

Microscopic study of fibres.

Simple experiments on physiology of plants.

(B) Dissection, microscopical examination and description (exclusive of identification) of parts of animals studied in theory.

Identification of slides.

Study of Human Anatomy and the structures of the organs as mentioned in the theory.

Books Recommended :

1. Atwood : Comparative Anatomy (Mosby).
2. Wallis : Analytical Microscopy
3. Esau : Plant Anatomy (John Wiley).

I.3. MATHEMATICS—I

Algebra.—Indices ; Surds ; Ratio and Proportion ; Irrational quantities ; Simultaneous equations : Solution of equations by Graphs ; quadratic equations with one or two unknowns ; Arithmetical, Geometrical and Harmonic Progressions ; Permutations and Combinations ; Statement and application of Binomial Theorem with positive integral index.

Mensuration.—Area of Rectangular figures and Triangles ; Circumference and Area of a Circle ; Surfaces and Volumes of Prisms ; Right Circular Cones ; Cylinders and Spheres and Geometry of the Sphere.

Trigonometry.—Sexagesimal and circular units of angular measurements ; Trigonometrical ratios and the simple relations connecting them ; Complementary and Supplementary angles ; Negative angles ; Sum and Difference of two angles ; Sum and difference of Sines and Cosines. General expression of simple Trigonometrical equations ; the relation between the sides and angles of a triangle. Logarithms and the use of Log

tab es. Solutions of triangles and simple cases of heights and distances radii of the circumscribed, inscribed and escribed circles of triangles, area of regular polygon, and of a circle, Graphs of simple trigonometrical functions.

Coordinate Geometry.—Coordinate axes and quadrants; Distance between two points; The Ratio formula; Area of a triangle; Equations of a Straight line. Use of semilogarithmic paper.

Lines parallel to the co-ordinate axes; The general equation of the first degree; equations of the Circles. General equation of a circle. Equation of a parabola.

1.4. MATHEMATICS—II

(A) *Differential Calculus.*—Functions, Limits, Differential Coefficient, Standard formulae. Simple differentiation, Geometrical Significance of Differential Coefficient, Differential Coefficient as rate measurer. Rule for Maxima and Minima of a function; Calculation of small corrections.

Integral Calculus.—Integration considered as converse of Differentiation: simple integration. Calculation of areas and volumes of standard bodies by use of integration. Use of gamma function.

Statics.—Force Parallelogram and Triangle of forces; Lami's Theorem; Resolution and Composition of Forces; Like and Unlike parallel forces; Moments; Centre of gravity of simple standard bodies; Laws of Friction; Simple problems in equilibrium of forces.

Dynamics.—Velocity, Acceleration, Motion in a Straight line, Motion under gravity, Laws of Motion, Work, Energy, Momentum, Power, Simple Harmonic Motion.

(B) *Statistics.*—Measures of Central tendency—Mean, Median, Mode; Dispersion—Standard deviation, Graphs, Histograms, Frequency polygons, Use of semi-log and log-log paper; Use of Newton's formula for interpolation with equal intervals; Calculation of Coefficient of Correlation; Standard error and Significance tests.

Textbooks Recommended :

1. Saunders: Mathematics and Statistics for Students of Pharmacy (Pharm. Press, London) Ayres.
2. First Year College Mathematics (Schaum, New York).
3. Allendoerfer and Oakley; Principles of Mathematics (Mc Graw).

1.5. PHYSICS

1. Fundamental laws of mechanics of particles and rigid bodies; Principles of conservation of mass, energy, momentum and angular momentum. Measurement of pressure, stability of floating bodies, surface tension and its measurement.

Filter pumps, simple exhaust pumps, Cenco Hyvac Rotary oil pump, Diffusion pump; Measurement of low pressures.

Gravitation, Stream line Flow of liquids. Viscosity, measurement of coefficient of viscosity, commercial viscometers. Mechanical equivalent

of heat, conduction, convection and radiation. Gas laws, specific heats of gases, isothermal and adiabatic compression and expansion. Liquefaction of gases.

Measurement of temperature by thermometers and pyrometers.

2. Geometrical optics: Chromatic aberration of lens and its correction. Objectives of high power of microscopes and telescopes. Ramsden's and Huyghen's eye pieces.

Physical optics : Huyghen's principle and formation of secondary wavelets. Phenomenon of interference and diffraction. Polarisation of light, methods of producing polarised light, reflection and double refraction. Nicol prism.

Spectra, classification and analysis—Atomic Structures.

3. Wave motion. S. H. M. Recording and Reproduction of sound. Ultrasonics production and uses.

4. Fundamental laws of electricity and magnetism and some of their applications. Magnetic lines of force, potential, equipotential surface, Faraday's experiment; capacity—specific inductive capacity, condenser. Static electricity. Forces and energy between magnets, force on a body in a magnetic field, Earth's magnetism.

Electricity: Primary and secondary cells: combination of cells; measurement of current, ammeter; voltmeter, Wattmeter, Galvanometer Electromagnetic induction, induction coil, self and mutual inductance, discharge tube phenomena, cathode rays, X-rays.

Practical work—Experiments illustrative of the theory. Experiments on viscosity; surface tension, calorimetry, thermometry, optics and use of optical systems, electricity and electrical measurements.

Books Recommended.

1. Stead: Elementary Physics (Churchill).
2. Darvell: Applied Physics. Vols. I and II (The English University Press).
3. Bernard : Laboratory experiments in College Physics (Ginn).
4. Ingersoll, Martin and Rouse: A Laboratory Manual of Experiments in Physics.
5. Schaum and Merwe: Theory and Problems of College Physics (Schaum).

1.6. GENERAL CHEMISTRY

A. *Atomic Structure.*—Introduction to atomic structure and its modern concept.

Properties of the ion.—Valency States: radicals, acids, bases and salts. Solutions of electrolytes. Faraday's Laws of electrolysis; chemical equivalents; hydrogen ion concentration and pH, Oxidation and Reduction defined electronically.

Behaviour of the molecule.—States of aggregation of matter, gases, liquids, solids, disperse systems, Kinetic theory of gases and the derivation of the simple gas laws; critical phenomena and the liquefaction of the gases;

Avogadro's hypothesis; vapour densities; diffusion; osmosis; vapour pressure of solutions; elevation of the boiling point and depression of the Freezing point; molecular and atomic weight determinations.

Condition and effects of reactions.—Thermochemistry and Calorimetry; heats of combustion, formation, and neutralisation, Hess's Law of Constant Heat Summation. The effect of temperature, pressure (concentration) and catalysts on the rate of chemical reaction. Chemical equilibrium in the gas phase and in solution; including solubility product; ionisation, hydrolysis of weak acids, bases, and their salts. Le Chatelier's principle. Law of Mass Action. Applications of these physico chemical principles to qualitative analysis. Buffer solutions.

Stoichiometry.—Solution of numerical problems involving physico-chemical problems studied in this course.

B. *Inorganic Chemistry.*—A systematic study of the selected elements group by group, in the periodic table and the inter-relationships of the selected elements including a comprehensive preliminary survey of fundamental principles; atomic structure, atomic spectra and the Periodic Laws; the properties of atomic nuclei; ions and ionic compounds, valency; thermodynamic and electro-chemical aspects of oxidation-reduction processes, discussion of important reactions and reagents. Nuclear reactions. Coordination compounds.

Applications of physico-chemical principles *e.g.*, mass action equilibrium, reaction rate, electrochemical series and the phase rule, in the study of technical processes and decomposition of chemicals.

C.1. Nature of Organic compounds. Electronic structure of elements with atomic numbers from 1—18. Unique character of carbon. Kekule's formulae and structural theory. Electron sharing and covalent bonds. Sigma and pi electrons. Tetrahedral configuration of carbon. Classification of Types. Geneva nomenclature. Aliphatic series and aromatic series.

2. Structures of Aliphatic compounds. Derivatives of methane, ethane, propane, butanes, pentanes and hexanes. Geneva system of nomenclature.

Compounds with functional groups. Butyl alcohols; Alkyl halides; Methyl ethers; Amines; Alkenes; Alkynes; Cycloalkenes. Geometrical isomerism.

Carbonyl compounds; Aldehydes; Ketones; Methyl esters.

Carboxylic acids; Resonance.

Physical properties and solubility relationships Electrophilic attack and Nucleophilic addition and its mechanism.

3. Aromatic hydrocarbons. Structure of benzene and other coal tar hydrocarbons. Nomenclature, Heterocyclic aromatics and Resonance stabilization.

4. Optical isomerism: Isomerism of lactic acids. Compounds with two dissimilar asymmetric carbon atoms. Compounds with several asymmetric carbon atoms. Tartaric Acids. Carbohydrates. Classification; Structure of glucose and fructose.

Practical Work 1. Purification of simple substances by crystallisation, sublimation, and fractional crystallisation.

2. Simple volumetric analysis involving acidimetry (use of methyl orange and phenolphthalein indicators), permanganometry including preparation of standard permanganate solutions and titrations of ferrous ammonium sulphate, iodimetry including standardisation of solutions of dichromate and sodium thiosulphate, and argentometry, including titration of an unknown solution of a chloride against standard silver nitrate using potassium chromate and fluorescein as indicators. Students will be expected to check their titrations of sodium hydroxide against hydrochloric acid using methyl orange as indicator within two parts per thousand.

3. Simple qualitative analysis of mixtures of not more than two pure inorganic compounds, excluding salts of organic acids, by performing systematically group tests, dry tests and flame tests.

4. Simple experiments of weighing, including finding out weight by method of oscillations, finding out weight of water of crystallisation of a hydrate, and finding out solubility of a substance by evaporation of a saturated solution and weighing.

5. Simple exercises on general Chemistry, including finding the pH of a solution by using different indicators, lowering of the freezing point of a solution by using a thermometer to read to the 10th of a degree (Not Beckmann), and molecular weight of a volatile liquid by Victor Meyer's method.

6. Plotting of solubility curves; vapor pressure and temperature diagrams.

7. Use of slide rule in calculations.

Books Recommended :

1. Wood and Keenan: General College Chemistry (Harper and Brother).
2. Smith: Practical Intermediate Chemistry (Macmillan).
3. Schrpff et al: Introduction to Semi-Micro Qualitative Analysis.
4. Luder, Vernon and Zuffanti: General Chemistry (Saunders).
5. Mack, Garrett, Haskins and Verhoek: Textbook of Chemistry (Ginn).
6. Schaum, Beckmann, Rosenberg: Theory and Problems of College Chemistry (Schaum).
7. Fieser and Fieser: Basic Organic Chemistry (Health).

1.7. HUMANITIES AND ENGLISH

A. English Grammar and Composition

1. Direct and Indirect Narration;
2. Common Expressive Words and Phrases;
3. Correct use of Prepositions;
4. Punctuation Marks.
5. Precis writing, letter writing, Keeping a diary; Paraphrasing and Expansion;
6. Figures of speech;
7. Essay.

B. Non-detailed study of the following Essays from Downs—Books that Changed the World (Mentor).

1. Thomas Paine—Common Sense.
2. Thomas Malthus—Essays on the Principle of population.
3. Charles Darwin—Origin of Species.
4. Thoreau—Civil Disobedience.
5. William Harvey—De Motu Cordis.

C. Non-detailed Study of the following essays from Thruelsen & Kobler—Adventures of the Mind (Knoff).

1. Williams S. Beck: The Riddle of Life.
2. Aldous Huxley: Drugs that Shape Men's Minds.
3. Martin Cyril D'Arcy: The varieties of Human Love.
4. Jacques Barzun: The Misbehavioral Science.
5. Loren Eiseley: An Evolutionist Looks at Modern Man.
6. Herbert Read: Art and Life.
7. Fred Hoyle: When Time began.
8. Edith Hamilton: The Lessons of the Past.
9. Lewis Mumford: How War Began.
10. Aaron Copland: Pleasures of Music.
11. S. I. Hayakawa : How words change our lives.
12. Bertrand Russell: The Expanding Mental Universe.

Text books :

1. Soares & Majumdar: Senior Course in English Composition (Oxford).
2. Downs: Books that Changed the World (Mentor).
3. Thruelsen and Kobler: Adventures of the Mind (Knoff).

1.8. ENGINEERING DRAWING

Construction of scale; Construction of curves; orthographic and isometric projections; sections in orthographic projections; conventions in mechanical drawing; dimensioning; working drawing of simple machine parts. *e.g.*, of bolts, studs, rivetted joints, keys, pulleys, brackets, coupling, etc.

Making of assembly and detailed drawing from sketches, reading and checking of drawings.

Copying and interpretation of quantitative flow sheets of materials and factory layouts with special reference to supply lines of water, steam and electric power. Blue printing.

Reference Books :

1. French and Virek: A Manual of Engineering Drawings for students and draftsmen. (McGraw).
2. Coover: Drawing, Sketching, and Blue Print Reading.

2.1. HUMANITIES AND ENGLISH CONTE.

A. English Grammar and Composition

1. Correct use of Prepositions.
2. Precis writing and Essay.
3. Pairs of words, Synonyms and Antonyms.

B. Non-detailed Study of the Essays from

1. Downs' Books that Changed the World, and
2. Thruelsen and Kobler; Adventures of the Mind (excluding those studied under 1.6)

Textbooks.—Soares and Majumdar : Senior Course in English Composition (Oxford).

2.2. ENGINEERING MECHANICS

Displacement; Velocity; Acceleration; Graphical representation of displacement, velocity and acceleration; Vector quantities; Velocities, Acceleration etc. considered as Vectors; Composition and Resolution of Velocities; Relative Velocity; Composition and Resolution of acceleration; Angular velocity and acceleration.

Motion under gravity; Motion on inclined plans; Projectiles; Inertia, Laws of Motion; Weight, Momentum, Units of force; Motion of connected bodies, Atwood's Machine.

Work: graphical representation of work; Power, Energy Principle of work; Conservation of energy.

Circular motion, Centrifugal and Centripetal force, Radial and tangential acceleration; Coriolis theorem; Motion in a curved track, Conical pendulum, Simple harmonic motion. Forces in simple harmonic motion. Alternating Vectors, Simple pendulum.

Concurrent forces, composition and resolution of forces; Triangle of forces; Polygon of forces. Analytical and graphical methods; Physical independence of forces; Moment of a force; Work done by torque; Sliding friction; Angle of friction; Action of Brakes; Friction and Efficiency of screw.

Statics of rigid bodies; Parallel forces. Moments; Principle of moments; Couples; Conditions of equilibrium; Analytical methods; methods of sections.

Books Recommended

1. Beer and Johnston's Mechanics for Engineers (McGraw).
2. Poorman; Applied Mechanic (McGraw).

2.3. ENGINEERING DRAWING

Sketching and Drawing of Pharmaceutical Equipment, e.g. the following:

Evaporators; Single, Triple Effect, and Vacuum pan evaporators. Spray Dryers; Film Dryers; Essential oil stills. Equipment used for size reduction mixing; compression including tableting; Hydraulic separation air separation, filtration, centrifuging; emulsifying. Sterilizers. Fractional

Distillation and Steam Distillation Equipment. Drying ovens. Granulating and Sieving machines; Conveyance of materials, equipment. Automatic bottling, ampulling, and filling of various types of materials.

Text Books

1. Remington : Practice of Pharmacy.
2. Catalogue of Manufacturers of pharmaceutical Equipment.

A. Human Anatomy

1. Specific knowledge concerning the structure of the following systems; cardiovascular, nervous, digestive, respiratory, endocrine, genito-urinal, the skin and the special senses.
2. Specific knowledge concerning the anatomic sites involved in the administration of drugs, such as, the gluteal and deltoid muscles.
3. Anatomical knowledge as a basis for understanding and rendering first aid.

B. Human Physiology

The general principles of human physiology; the structural basis of the body; the elementary and proximate constituents of protoplasm the physico-chemical principles of colloids; membrane permeability; filtration, ultrafiltration and dialysis, Enzymes and enzyme action.

Voluntary striated muscle, plain muscle and other contractile tissues; nerve fibres.

The central nervous system; the spinal chord and its relationship to the higher parts of the CNS; Characteristics of reflex actions; higher efferent paths; the cerebral hemispheres and the efferent paths; Functions of the cerebral cortex; the cerebellum; the autonomic system.

The nervous mechanism of sensation; vision, hearing and speech; cutaneous sensations, sensations of smell and taste.

Systems for distribution of materials; Blood, circulation and respiration.

The intake of materials; Nutrition and Metabolism. The removal of waste materials and temperature conservation, Renal excretion; the skin glands; temperature and heat balance; heat balance of the body.

The endocrine organs and reproduction; the formation of germ cells; reproduction in man and other mammals; the secretion and properties of milk; heredity.

C. Histology

An elementary knowledge of the microscopical structure of the following:—muscle and nerve, the heart blood vessels and blood; the digestive glands; stomach and intestines; liver; kidneys; skin; the endocrine glands and the reproductive organs, including the mammary gland and the placenta.

Practical Work

Histology of the tissues of the body; experiments demonstrating physiological principles; properties of the cardiac muscle; isolated muscle; muscle nerve preparations. To recognise and describe with diagrams, histological preparations of any tissue or organs mentioned in the syllabus on theory.

Text Book

1. Francis; Introduction to Human Anatomy (Mosby).
2. Anthony; Anatomy and Physiology Laboratory Manual (Mosby).
3. Francis and Farrell; Integrated Anatomy and Physiology (Mosby).
4. Guyton; Function of the Human Body (Saunders).
5. Winton and Bayliss; Human Physiology (Churchill).

2.5.(a) GENERAL CHEMISTRY

Organic Chemistry

A general consideration of the mechanism of simple organic reactions. The electronic structure of organic compounds and its applications in interpretation of reactions. Elementary idea regarding resonance as one exemplified by resonance of carboxyl group, carboxylate ion, conjugate dienes, allyl carbonium ions, benzene, aryl halides, vinylhalides, benzyl carbonium ion, diazonium ion, enols and enolate ions, and guanidinium ion.

A systematic study of organic chemistry, both aliphatic and aromatic (excluding heterocyclic compounds, terpenes and detailed treatment of stereochemistry of carbohydrates). The methods of preparation, general chemical properties of substances containing the chief functional groups, illustrated by the compounds of pharmaceutical importance. The entire course will be treated from the modern point of view and electronic interpretation of reactions and concept of resonance will be freely used.

Practical Work

1. Preparation of the following :
 - (a) Caffeine from tea dust; Hippuric acid from Urine; Creatine from Meat ; Casein and lactose from milk, Saccharic acid from Glucose ; Alpha Methyl Glucoside from anhydrous glucose.
 - (b) Benzoyl chloride and Ethyl benzoate from Benzoic acid, Cinnamic and Mandelic acids from Benzaldehyde ; Nitrobenzoic acid, m-Aminobenzoic acid, m-hydrox benzoic acid starting from benzoic acid ; p-Nitrobenzoic acid from p-nitrotoluene ; Fluorescein and Eosin ; Salicylaldehyde from phenol ; Sulphanilic acid.

2. Identification or reference to a class of organic compounds based on tests of functional groups, solubility, m.p., b.p., specific gravity, and preparation of simple derivatives.

Text Books

1. Conant and Blatt; Chemistry of Organic Compounds (Macmillan).
2. Geissman; Principles of Organic Chemistry (Freeman).
3. Smith and Jones ; A scheme of Qualitative Organic Analysis (Blackie). Gattermann ; Laboratory Methods of Organic Chemistry.

2.5. (b) PHYSICAL CHEMISTRY

The principles of physical chemistry treated in an elementary manner specially with reference to the solution of problems and their applications to pharmacy and Biochemistry, and among other including the following :

(1) Composition and physical states of matter. Properties of gases and elementary kinetic theory. Properties of liquids ; vapour pressure ; critical point and critical constants ; molar volume, viscosity, surface tension, parachor, molecular refractivity, optical rotation, dipole moment, absorption spectra, X-ray analysis. Physical measurements, molecular structure and chemical constitution.

(2) Properties of dilute solutions ; osmosis and osmotic pressure, molecular weight determinations ; Raoult's Law ; real solutions, deviations, vapour pressure, boiling point and freezing point determinations.

(3) Equilibria and kinetics ; Derivation of the Law of Mass action on the basis of kinetic theory. Effect of pressure and temperature on equilibrium. Arrhenius Equation. Energy of activation. Order of reaction. Theory of first order reactions. Heterogeneous equilibria. Applications of the Law of Mass Action to Quantitative Analysis. Ionic reactions. Neutral salt effect.

(4) Adsorption ; Chromatography ; Ion-Exchange resins ; Physical Chemistry of Exchange Equilibria, Donnan Equilibrium. Recent developments. Applications.

(5) Colloidal systems, Suspensions, Emulsions and foams. Particle size and methods of its determination. Catalysis ; Homogeneous and Heterogeneous. Enzymatic Catalysis.

(6) The Phase Rule ; One and two component systems. Solutions of liquids in liquids ; Fractional distillation ; Distillation in steam ; Vacuum distillation. Distribution Law. Solutions of solids in liquids, Solubility curves. Partition Chromatography. Solubility of gases in liquids. Henry's law.

(7) Viscosity and flow properties of materials. Rheology, thixotropy and their applications in pharmacy. Surface tension, wetting technical applications ; detergency ; Flotation.

(8) Photochemistry ; Types of spectra. Photo-excitation of molecules. Laws of photochemistry. Photochemical kinetics. Photosensitisation. Luminescence. Photography. Biological applications.

(9) Thermochemistry ; First and Second Law of Thermodynamics. Free Energy.

(10) Electrochemistry ; Electronic and electrolytic conduction. Faraday's Laws of electrolysis. Conductivity and Transport numbers. Strong and weak electrolytes. Voltaic cells ; reversibility, polarisation. Single electrode potentials ; concentration cells, oxidation-reduction potentials ; standard Electrodes. Determination of hydrogen ion concentration and solubility.

Practical Work

N.B.—Students will be required to write detailed reports on each experiment, describing, among others, the following :—

- (a) Theoretical basis, including use of graphical methods, if applicable.

- (b) Experimental procedure, the sources of error, the limitations of the method, and a description of the apparatus used, with neat annotated diagram in India Ink.
- (c) Pharmaceutical applications with a few concrete examples.

Experiments

- (i) Molecular weight determination by freezing point and boiling point methods.
- (ii) The determination of simple reaction velocities.
- (iii) Titration curves of acids and bases.
- (iv) The determination of pH by means of buffers and use of indicators.
- (v) Experiments on surface tension and viscosity.
- (vi) Experiments on solubility of solids and liquids in volatile liquids and water.
- (vii) Experiments on partition coefficient.
- (viii) Preparation of colloids and study of their properties. Determination of particle size. Determination of Gold number. Electrophoresis.
- (ix) Experiments on Adsorption.
- (x) Experiments on Chromatography and Ion-exchange resins.
- (xi) Distillation of binary mixtures.
- (xii) Experiments on Thermochemistry.
- (xiii) Calibration of volumetric apparatus.
- (xiv) Calibration of weights.

Books Recommended

1. Daniels : Physical Chemistry (Asia).
2. Glasstone : Elements of Physical Chemistry.
3. Martin : Physical Pharmacy.
4. Jirgensons : Organic Colloids.
5. Kitchener : Ion-Exchange Resins (Methuen).
6. Ellis and Mills : Laboratory Manual of Physical Chemistry.

2.6. ANALYTICAL CHEMISTRY

A. Importance of significant figures and their correct use in volumetric and gravimetric analysis and in solution of problems. Discussion of the principles of volumetric and gravimetric analysis with attention to the sources of error, theory of indicators, and solution of stoichiometric problems. Adsorption indicators and redox indicators.

B. Modern theory of acids and bases. Hydrolysis of salts. Amphoteric substances. Buffer solutions and pH values and their calculation. Commonion effect and solubility product.

C. The theoretical basis of qualitative inorganic analysis with reference to the reactions and physico-chemical principles involved. Ionic equations. A knowledge of the preparation and chemistry of the following substances with special reference to their use in Analytical Chemistry :

Sodium acetate, sodium peroxide, sodium cyanide, sodium nitrite, sodium thiosulphate, potassium permanganate, and dichromate,

potassium ferro-and ferricyanide, potassium thiocyanate, silver nitrate, titanous chloride, ceric sulphate, hydrazine, Nessler's reagent, Mayer's reagent, phosphomolybdic acid, phosphotungstic acid and platinum chloride.

- D. 1. Principles of gas analysis.
2. Practice in solution of analytical problems.

Practical Work

1. Qualitative analysis of inorganic mixtures containing six radicals, including interfering radicals, *e. g.* phosphate, fluoride, oxalate tartarate, borate, citrate, acetate, lactate.

2. Assays of pharmaceutical substances involving the use of acidimetry and alkalimetry, oxidation-reduction reactions, precipitation reactions, and gravimetric methods of analysis. Assays of boric acid and borax aspirin, Solution of Iodine, Arsenical Solution, Mercuric chloride, sodium glycerophosphate, phenol, saccharated iron carbonate, ferrous and ferric salts, copper sulphate shall be carried out by all students.

3. Limit tests of the Pharmacopoeia of India.

Books Recommended

1. Schroff : Physico-Chemical Calculations.
2. Ayres : Quantitative Chemical Analysis.
3. Schroff et al : Semi-micro Qualitative chemical analysis.

2.7. PHYSICS (INSTRUMENTS)

Optics and Elementary Spectroscopy

1. Total internal reflection, Abbe's and Pulfrich's refractometer, Objectives and Eyepieces, Camera, Telescope, Compound microscope, Eye, Defects of vision, Epidiascope.

Radiation and spectroscopy—Atomic structure, Different types of spectra, Emission and Absorption spectra, Infrared and Ultra-violet spectroscopic techniques, Elements of molecular spectra and Raman spectra, spectrograph, Fluorescence and Phosphorescence, Spectrophotometers. Colorimeters, Nephelometers, Fluorimeters.

Wave Theory of light.

Conditions of interference, Interference by thin films, Multiple beam interferometry, Fresnel's Biprism, Newton's Rings, Use of interference fringes, Diffraction, Circular obstacle, Straight edge,

Resolving power of a telescope and microscope, Plane diffraction grating.

Polarisation, Double refraction. Nicol prism, optical Activity, The Polarimeter.

Elementary Nuclear Physics, Electrical Measurements and General Electronics

2. Properties of Radioactive Radiations, Production of Radio Isotopes, Artificial disintegration, Ionization Chamber, Geiger Muller Counters.

Moving Coil Galvanometers, Ballistic Galvanometers, Ammeters and Voltmeters, Calibration of a galvanometer, ammeter and voltmeter ; Wheatstone Bridge, Principle of Potentiometer and measurement of E.M.Fs., Thermo E.M.Fs. and Resistance, Alternating Current, Mutual induction, Transformers, Coupled Circuits, A.C. Bridges.

3. Thermionic Emission. Diode, Triode and Pentode and their characteristics, Simple circuits, Cathode Ray Oscillographs, Scalers, Photomultipliers.

4. Ultra-sonics generation and uses.

Practical

Experiments illustrating the principle and use of instruments described in the theory.

Detailed study of the optical parts of instruments underlined shall be studied.

Text Book

Freeman : Modern Introductory Physics (McGraw Hill).

Reference Books

Wright : The Measurement of Colour (Chapters 1-5) Hilger and Watts.

Sears & Zemmansky : University Physics Part, 2 (Asia).

Daniels : Experimental Physical Chemistry (Chap. 23, 24 and 25, McGraw Hill).

3.1. PHARMACEUTICAL CHEMISTRY—I

Section A—Inorganic

A knowledge of methods of preparation, chemistry and pharmaceutical properties of elements and compounds described in the Pharmacopocia of India.

A knowledge of the chemistry of limit test, tests of purity and identity, and assay of elements and Inorganic substances of the Pharmacopocia of India.

Study of the methods of preparations and use of inorganic reagents employed in synthetic or analytic organic chemistry.

Section B—Inorganic

(A) The Chemistry (including simple electronics interpretations of the following organic compounds and such of their derivatives as are of pharmaceutical importance ; diphenylethane, triphenylmethane, naphthalene, anthrocene, furan, pyrrole, thiazole, pyridine, pyrazole, imidazole, quinoline, isoquinoline, acridine. The structure of phenanthrene.

An elementary knowledge of the classification and general characteristics of proteins, of essential amino acids and their relationship to proteins.

The preparation and structure of uric acid, caffeine, theobromine and theophylline.

(B) The extraction, general constitution, and properties of the fixed oils, fats and waxes of the British Pharmacopoeia and the Pharmacopoeia of India.

The principles involved in the estimation of oxygenated constituents of essential oils. A knowledge of the structure and simple chemical properties of terpineol, limonene, carvone, menthol and camphor.

(C) The general chemistry of the carbohydrates, with a knowledge of the structure, excluding stereochemical considerations, of glucose and methyl glucosides, fructose, sucrose, lactose, Salicin.

(D) Discussion and evaluation of general synthetic methods (including more important reagents) of organic chemistry with special reference to compounds of pharmaceutical or diagnostic importance.

Section C—Physical

Study of the applications of physico-chemical principles to pharmacy with special reference to the following :—

Theory and properties of disperse systems, surface and Interfacial tension, Solubility and Solubilization of drugs ; Metal ion and molecular complexation; Accelerated methods of stability testing, rate studies of drug absorption and elimination; Micromeritics of powders and physics of solid dosage forms; and the Rheology of Disperse systems; Emulsions, Suspensions, and Semi-solid forms.

Practical Work

1. Testing of inorganic and organic pharmaceutical substance according to the Pharmacopoeia of India, or British Pharmacopoeia (60 hours).

2. Determination of the purity of fixed oils, fats, waxes, soaps, etc. (30 hours).

3. Determination of the purity of essential oils (30 hours).

4. Study of the following :—

(a) Acid catalyzed hydrolysis of procaine.

(b) Effect of dielectric constant on the rate of glucose decomposition in acidic solution.

(c) Stabilization of Benzocaine by complexation with Caffeine.

(d) Accelerated breakdown of a drug at elevated temperatures.

(e) Determination of gold number of acacia and tragacanth.

(f) Phase diagram of the ternary system : water, Tween 20, and peppermint oil (60 hours).

N.B.—Quantitative estimations of such organic substances are to be taken as involve estimations of various functional groups also.

Books Recommended

1. Driver : Bentley and Driver's Textbook of Pharmaceutical Chemistry (Oxford).

2. Martin : Physical Pharmacy (Lea and Febiger).

3. Noller : Organic Chemistry (Saunders).

4. Hoffman : New Unguants bases and lotions.

3·1·b APPLIED BIOCHEMISTRY

(A) The scope of biochemistry ; physico-chemical properties of biochemical systems.

Chemistry and meta-bolism of carbohydrates, lipids, and proteins including nucleoproteins. Role of minerals and of water in biochemica processes.

Biochemistry of the important body tissues and fluids chemistry and general properties of enzymes and the mechanism of their action. Energy and phosphate metabolism. Detoxication mechanisms.

(B) A knowledge of vitamins and hormones and their biochemical importance. Nutrition, health and dietetics.

(C) The principles involved and apparatus used in the analysis of blood, urine, gastric juice and faeces. Interpretation of results.

Principles of the methods used in public health laboratories for the analysis of foods and water.

Practical Work

Chemical tests for the essential amino acids, carbohydrates, lipids and proteins.

Qualitative and quantitative examination of urine, blood, gastric juice and faeces including detection of abnormal constituents and their estimation.

Food analysis : Analysis of milk.

Text Books

1. Harrison : A guide to Biochemistry (Cambridge University).
2. Thorpe : Biochemistry for Medical students.

Reference Books

1. Kleiner and Orten : Human Biochemistry.
2. Hawk, Oser, Summerson : Practical Physiological Chemistry.
3. Martindales's Extra Pharmacopoeia Vol. II.
4. Woodman : Food Analysis.
5. American Public Health Association : Standard Methods for the Examination of Water, Sewage and Industrial wastes.

3·2. PREPARATIVE

A. Pharmaceutical profession and its responsibilities ; institution of Pharmacy in relation to society ; Pharmacists in relation to doctors, nurses, patients, customers, the public, wholesale dealers, employers and employees ; Code of conduct in professional service.

Historical development of British Pharmacopoeia, United States Pharmacopoeia and Pharmacopoeia of India.

B. Principles of Pharmacy and their applications to preparation of official galenicals ;

Metrology—Measurement of Weight and Volume and Appliances used therefor.

Heat : sources and uses of Heat in Pharmacy ;

Heat processes—Fusion, Ignition, Calcination, Drying, Desiccation, Exsiccation, Evaporation, Distillation and Sublimation.

Refrigeration—principles and uses of Refrigerators, Cold Storage and freeze drying.

Solids—Precipitation, Crystallization, Granulations and Scaling.

Solution—Types, Solubility, Solvents, Properties of Solutions like Osmosis, Viscosity, Surface tension, Adsorption, Ionization and pH.

Colloidal State—Colloids, Suspensoids and Emuloids.

Mechanical Separation—Decantation, Filtration, Colation, Centrifugal separation and other means of clarifications.

Drugs of Vegetable and Animal Origin—Collection, Drying and Storage, Enzyme Action in Drugs.

Mechanical Sub-Division of Drugs and Chemicals—Comminution, Trituration, Mixing and sifting, grading of powders.

Extraction Processes—Expression, Infusion, Decoction, Maceration, Percolation, Dia-colation and Diffusion.

Apparatus and Aids involved in the above processes.

C. Surgical Dressings, Ligatures and Sutures and their standards.

Practical Work

Preparation of simple pharmaceutical products including inorganic pharmaceuticals and galenicals, illustrating the principles and processes given under theory.

Text Books

1. Davious-Bentley's Text Book of Pharmaceutics.
2. Pharmacopoeia of India.
3. British Pharmacopoeia.
4. Cooper : Tutorial Pharmacy.

3.3. DISPENSING PHARMACY

A. Principles of Dispensing

Preparation—its definition, significance and handling. Accuracy and care in dispensing, form of administering medicines, labelling and packing and containers for dispensed medicines.

The procedure adopted in handling prescriptions in dispensaries and hospitals. Principles involved and procedures adopted in the dispensing of bougies, cachets, capsules, gargles, inhalations, liniments, lotions, mixtures, ointments, pastes, pills, plasters, powders, sprays, suppositories, sterilized preparations and incompatible prescriptions.

Apparatus and equipment used for dispensing medicines.

B. Pharmaceutical Calculations

Different systems of weights and measures; calculations of doses; reducing and enlarging recipes; percentage solutions; alligation; isotonic solutions; specific gravity; specific volume; proof spirit; dilution and concentration of solutions; displacement values of suppository bases.

Latin

Knowledge of Latin as required in interpretation of prescriptions and their translation into English.

C. Posology

Detection of overdoses in prescriptions. Fair pricing and fair service.

Practical Work

1. The dispensing of a range of prescriptions as given under theory covering all classes of prescriptions maintaining complete record of each.

Translation of directions and proper labelling, finishing and wrapping of articles neatly.

2. Distribution of sterile preparations under aseptic conditions and performance of sterility tests.

Text Books

1. Husa : Pharmaceutical Dispensing.

2. Schroff Srivastava et al : Pharmaceutical Arithmetic and Latin (Sagar Book Deptt., University of Saugar).

Reference Books

Cook and Martin; Remington's Practice of Pharmacy.

3.4. FORENSIC PHARMACY

A. Study of Dangerous Drugs Act, 1930; Opium Act; Poisons Act; Drugs Act, 1940; Drugs Rules, 1945; Pharmacy Act, 1948; The Excise Act and Rules; The Drugs and Magic Remedies Act; Shop Assistant's Act and such other State Acts as materially affect the Pharmaceutical profession.

Controls on labels and labelling, packaging and storage. Patent law, Laws regulating introduction of new drugs.

B. Proprieties of the following classes of drugs with special reference to their nomenclature, composition, and legal requirements. Sulphonamides, antibiotics, Berbiturates, Antihistaminics, Vitamins, Hormones, A.C.T.H.

The students will also be expected to be acquainted with Internationally known proprieties marketed in India.

Reference Books

1. Report of the Pharmaceutical Enquiry Committee.

2. Drugs Standard Control (Government of India).

3. Pharmacy Act and all other Acts pertaining to the syllabus.

4. Austin Smith and Herrick: Drug Research and Development (Revere Publishing Co.).

5. Modern Drug Encyclopaedia.

6. Mertindale's Extra Pharmacopoeia.

3.5. PHARMACOGNOSY I

(A) Introduction to the History of Pharmacognosy and the various classification of drugs based on (i) Chemical constituents, (ii) Morphological and pharmacogonostic characters, and (iii) pharmacological actions.

(B) Deterioration of drugs due to insects and other pests. Changes occurring in drying, communication and their storage. Enzyme action in vegetable and animal drugs.

A general study of adulteration and evaluation of drugs (excluding microscopic but including chemical and pharmacological methods).

A general study of geographical distribution, cultivation, collection, preparation for the market and storage of drugs.

(C) Macroscopical characters, commercial varieties, adulterants and substitutes, chemical constituents, and uses of the drugs official in the Pharmacopoeia of India.

A study of fibres and fabrics used for surgical dressings and materials used for filtration.

Practical Work

(A) Examination and description of the macroscopical characters (including diagrammatic transverse section wherever possible) of the drugs.

(B) Simple experiments on the evaluation of drugs excluding microscopic but including the various limit tests as given in the Pharmacopoeia of India.

(C) Identification of, in their entire and broken condition by their gross characters and by qualitative tests, the crude drugs studies in theory.

(D) Examination of fibres and fabrics used for surgical dressing and materials used for filtration.

Books Recommended

1. Wallis : A Test Book of Pharmacognosy.
2. Gathercoal and Wirth : A Text book of Pharmacognosy.
3. Wallis : Practical Pharmacognosy.

3.6. MICROBIOLOGY

(A) General technique of microbiology. General morphology, life history, reproduction, classification, methods of identification, nutrition and physiology of yeasts, moulds and bacteria., Preparation and tests of sterility of culture media.

(B) Principles of sterilisation, isolation, pure cultures. The efficiency of various methods of sterilisation with special reference to thermolabile substances, glassware and surgical dressings, ligatures and sutures; their tests for sterility; storage; labelling. The aseptic handling of sterile material and medicaments.

Effects of physical and chemical agents; antiseptics; bactericides and bacteriostatics; germicides; sanitizers and disinfectants. The importance of their use and their evaluation.

(C) General principles of immunology, serology and immunochemistry. The general methods of preparation, preservation and standardisation of sera, vaccines, diagnostic agents and biological products.

(D) The modes of transmission of common infections and communicable diseases, their classification, the methods of control and diagnostic tests for organisms of special interest to India. Agents of virus, protozoal and fungus diseases.

(E) Food industries and Food spoilage. Fermentations promoted by yeasts, moulds, bacteria (alcohol, glycerol, acetic, lactic, butyric and slime forming).

Antibiotics : their preparation and standardisation. Microbiological methods of standardisation of vitamins.

Practical Work

(A) Preparation of various types of culture media. Sub-culturing of common aerobic and anaerobic micro organisms. Staining techniques and isolation and identification of pure cultures by biochemical methods.

(B) Sterility Tests ; Glass containers and closures, injectules, Surgical materials and medicaments.

Evaluation of antiseptics : Rideal—Walker Value.

(C) Bacteriological examination of water and milk. Microbiological Assay of vitamins and amino acids, e.g. ribo-flavine and leucine.

Tests for potency of antibiotics.

Text Books

1. Frobisher : Text-book of Microbiology.
2. Salle : Laboratory Manual of Bacteriology.

Reference Books

1. Underkofler and Hickey : Industrial fermentations, 2 Vols. (inter-science).
2. Reddish : Antiseptics, Disinfectants, fungicides and Chemical and physical sterilisation (Lea and Febiger).
3. Schaub, Foley, Scott and Bailey : Diagnostic Bacteriology.
4. Cushing and Campbell : Principles of Immunology (McGraw).
5. Sykes : Disinfection and Sterilization.
6. Methods of Vitamin Assay by Association of Vitamin Chemists.
7. Barton-Wright : Microbiological Assay of Vitamins of B-Complex and amino acids.

3·7. PHARMACEUTICAL ENGINEERING—I

I. Transport and Storage Materials

The principles of mechanical handling and the plant used for the conveyance of solids, semifluids, liquids and gases. Design of bins, hoppers and storage tanks. The chemical engineering aspects of problems relating to the flow of gases and fluids and methods of measuring pressure, fluid flow, liquid level, and temperature. An introduction to process control system.

The economic design of pipe lines and the calculations of power requirements. Design and operation of pumps, blowers and elevators.

Packaging and conveyance of manufactured materials.

II. Heat Transmission

Mechanism of heat transfer by conduction, radiation and convection. Condensation of vapours : Effect of non-condensable gases. Radiation from surfaces. Effect of nature of materials and boundary films of liquids

and gases on heat transmission and the relation to fluid friction. Heat conservation and insulation. The problem of heat transfer in the process of freeze drying. Methods and applications of inductive heating.

III. Materials of construction

The nature, properties and uses of important materials employed in the construction and erection of plants :—metals, alloys and non-metals with special reference to corrosion, fabrication and operating conditions on the physical and chemical behaviour of metals and alloys.

Iron and steel. Alloy steels and irons, particularly heat resistant and corrosion resistant types, high silicon iron; stainless steels.

Lead, copper, tin, zinc, nickel, silver, aluminium and their more important alloys.

Timber, rubber, plastics, jointing materials, refractories, chemical stoneware, enamels, cement and concrete.

The chemical principles underlying corrosion in the presence of liquids and by direct attack. Methods of reducing corrosion. Protective coatings.

Books Recommended

1. Leighon—Engineering materials.
2. McAdams—Heat Transmission.
3. Parker, Harney and Stateler : Elements of Food Engineering.

4.1. PHARMACEUTICAL CHEMISTRY—II

Section A—Organic

A knowledge of the chemistry (including synthesis) of the following groups of medicinal substances : Analgesics, Tranquilizing agents ; Hypnotics, Local anaesthetics ; Radiopaque organic iodine compounds ; Antiseptics, Germicides, Bacteriostatics and Bactericides ; Diuretics Organo-metallic compounds ; Antipyretics ; Pressor drugs ; antihistaminics ; dyes.

Methods of extraction and determination of Structure of Plant alkaloids ; quantitative determination of Groups ; Degradations Application of the above to the determination of structure of Ephedra bases. Classification of Official alkaloids on their skeletal structures.

Steroids.—Nomenclature, skeleton structure of Ergosterol, Cholesterol, Bile acids, Cortisones. Properties and Structures of sex hormones. Extraction of progesterons. Interrelations of Oestrone and Oestriol. Irradiation of Ergosterol ; Calciferol Synthetic hormones.

Vitamins.—Classification of vitamins. Determination of structure of thiamine. Skeleton structures of vitamins official in the B.P and their stability.

Glycosides.—Properties, actions and uses. A knowledge of the chemistry of amygdalin and salicin. General study of the following glycosides : Rutin and Hesperidin ; Saponins ; cardiac glycosides with special reference to those official in the B.P.

Terpenes.—Acyclic terpenes—Germiol and its constitution ; Citral and the synthesis of ionones ; Monocyclic terpenes ; Interrelationship

of limonenes, dipontene, alpha-terpinol; Terpin hydrate, cincol and carvone ; Interrelations of Menthol, Menthone, p-menthane and Thymol. Synthesis of Camphor and its chemical properties. The carotenoids ; alpha-and beta-carotenone.

Section B—Biochemical

Physio-chemical properties in Relation to Biologic Action ; Solubility and Partition Coefficients ; pH considerations ; Surface-activity ; Oxidation-Reduction potentials ; Hydrogen bonding ; steric relationships and Drug action ; Isoosterism ; Resonance.

Metabolic Changes of Drugs and Related organic Compounds in Detoxication ; General Considerations and Detoxication Reactions. *Prolonged Drug Action*.—Rate of Absorption and Routs of Administration ; Prolonged Blood levels ; slowed absorption ; Factors ; Delayed Disintegration.

Section C—Incompatibilities

(10 lectures)

General Incompatibilities : Therapeutic Incompatibilities ; Therapeutic classification of important drugs and their antagonistic combinations. Physical and Chemical incompatibilities and their correction.

Organic incompatibilities.—Solubility Factors ; Temperature and Structural Solubility Effects ; Dielectric constants ; Hydrogenbonding, Association and Chelation, Molecular weight ; Presence of other substances. pH factors. Ionisation. Therapeutic pH considerations ; Chemical Factors ; Cationic, Nonionic-Anionic relationships.

Specific Organic incompatibilities.—Hydrocarbons and Halogenated hydrocarbons ; Alcohols and their halogenated derivatives ; Phenolic compounds ; Aldehydes Ketones and Acids ; Soaps, esters and ethers ; Amines and Amine Salts ; Aniline derivatives ; Alkaloids and synthetics similar to them ; Cinchophen and derivatives ; Pyrazolone derivatives ; Aliphatic and Aromatic Aminoacids ; quaternary ammonium compounds ; Urea derivatives ; Purine bases ; Imides ; Organic Halogen derivatives ; Chloramine derivatives ; Sulphones and Sulphamates ; Carbohydrates ; Gume. Glycosides ; Proteins and Enzymes ; Organic Peroxides ; Resins ; Organic Antimony, Arsenic, Bismuth and Mercury compounds.

Incompatibilities of Antibiotics.—Barbiturates ; Hormones ; Anti-histamine ; Vitamins ; Sulphonamides ; Local Anaesthetics ; Dyes, vegetable and Animal colours ; Surface Active Agents.

(30 lectures)

Practical Work

1. Assays of Crude drugs and their preparations (60 hours).
2. Assays of Tablets, Injectules, etc. (40 hours).
3. Study of Incompatibilities of a selected number of Organic compounds (30 hours).
4. Library or Laboratory problem (60 hours).

Text Book:

Driver : Bentley and Driver's Textbook of Pharmaceutical Chemistry.

Husa : Pharmaceutical Dispensing (Mack) Wilson and Gisvold : Textbook of Organic Medicinal and Pharmaceutical Chemistry.

Reference Books

Finar : Organic Chemistry (Longmans); Royals : Advanced Organic Chemistry (Constable); Turner and Harris: Organic Chemistry (Longmans); Cook and Martin: Remington's Practice of Pharmac; May: Chemistry of Synthetic Drugs; Martin : Physical Pharmacy; Gattermann : Laboratory Methods of Organic Chemistry; Gilman : Organic Chemistry; Evers and Caldwell : Chemistry of Drugs.

PHARMACEUTICAL CHEMISTRY—III

Analytical Chemistry

Principles of quantitative separations and determinations. Applications of volumetric and gravimetric methods to the determination of organic functional groups as described in the pharmacopoeia of India. Practice in stoichiometric calculations.

General treatment of the theory and application of modern optical and electrical instruments in solution of pharmaceutical chemical problems. A working knowledge of the following including their applications in pharmacy—Potentiometry, polarography, conductometry, colorimetry, turbidimetry, nephelometry and fluorimetry. An introduction to the study of ultraviolet, visible and infrared spectrophotometry and their applications in so far as they are encountered in official analytical procedure.

Practical Work

1. Determination of Physical Constants used as criteria of purity including refractive index, specific rotation, viscosity, extinction coefficient, specific gravity. Use of colorimeters, nephelometers, fluorimeters, spectrophotometers, refractometers and polarimeters;
2. Conductometric and potentiometric analysis ;
3. Electro-chemical analysis;
4. Simple qualitative separations and quantitative estimations involving chromatographic technique and ion-exchange resins.

Text Books

1. Ayres : Quantitative Chemical Analysis.
2. Ellis and Mills : Laboratory Manual of Physical Chemistry.

Reference Books

1. Willard : Instrumental methods of Analysis.
2. Stone : Determinations of organic compounds.
3. Fritz and Hammond : Quantitative Organic Analysis.

PHARMACEUTICAL ENGINEERING—II

It is intended that this subject should be taught by a teacher who had training in Chemical Engineering with special reference to Pharmaceutical industry.

A. Unit operations and processes—1. Treatment of materials. The physical, physico-chemical and engineering principles governing the design, construction, lay-out and operation of plant for processes

employed in pharmaceutical industry with special reference to the following :-

- (a) Size reduction;
- (b) Separation without change of phase or physical state :—
 - (i) Hydraulic separation,
 - (ii) Air separation,
 - (iii) Filtration,
 - (iv) Centrifuging;
- (c) Separation with change of phase or physical state :—
 - (i) Leaching and extraction,
 - (ii) Evaporation,
 - (iii) Distillation and condensation,
 - (iv) Drying,
 - (v) Crystallisation,
 - (vi) Absorption and adsorption. Ion exchange;
- (d) Mixing;
- (e) Compression;
- (f) Humidification;
- (g) Refrigeration;
- (h) Sterilization;

2. The design, construction and operation of the principal types of plants used in the above operations.

B. Safety Methods in Pharmaceutical Laboratories and Works.

—An appreciation of mechanical, chemical and electrical fire hazards. The problems of explosive hazards including inflammable gases and dusts.

C. Preparation of quantitative flow sheets of materials, energy and time and their relationship to plant design.

PHARMACEUTICAL ENGINEERING LABORATORY

1. Fluid flow and pressure drop measurements in pipes. Centrifugal, air lift and jet pumps. Heat transfer in pipes, jacketed pans and steam kettles. Condensation in vertical and horizontal tubular condensers. Use of thermocouples and pyrometers. Distillation, evaporation and drying experiments. Sedimentation in liquids and air elutriation. Screen analysis of powders.

2. Plant study of evaporation, drying, filtration, liquid extraction, gas absorption, refrigeration, water cooling, fractional distillation, sterilization etc.

- 3. (a) Complete analysis of coal and fuel gas.
- (b) Analysis of water.

Reference Books

- 1. Parker, Harvey & Stateler : Elements of Food Engineering;
- 2. Kunin : Ion-Exchange Resins;
- 3. Shreve : Chemical Process Industries;
- 4. Mcadams : Heat Transmission;
- 5. Peters : Plant Design and Economics for Chemical Engineers;

6. Jordan : Chemical Pilot Plant Practice;
7. Steel : Biochemical Engineering;
8. Johnstone & Thring : Pilot Plants, Models, and Scale up methods in Chemical Engineering;
9. McCabe and Smith : Unit operations of Chemical Engineering;
10. Modern Chemical Processes : Vols. I-IV (Reinhold).

4.4. PHARMACEUTICAL PREPARATIONS

A. Pharmaceutical processes and products.—Principles and technique ; preparation of material ; solvent ; extraction ; assay and standardisation ; clarification and filtration including removal of fat, proteins, gums, pectins, tannins ; ultrafiltration, stabilization maintenance of stability during storage ; enzymes.

The products of the Pharmacopoeia of India to be used to illustrate the above.

B. A discussion of selected individual monographs from the Pharmacopoeia of India with special attention directed towards :

- (a) standards of purity,
- (b) reasons for the inclusion of various ingredients within a formulation,
- (c) reasons behind the various manipulative procedures involved in the manufacture with attention being given to ingredients requiring special handling,
- (d) specific deviations from storage requirements of the class with reasons, and
- (e) dispensing practice and its bearing on formulations on a large scale. The chemical, physical, pharmacological and therapeutic factors involved in the presentation, formulation and stabilisation of pharmaceutical and cosmetic preparations.

Dermatological vehicles and their functions, dermatological medicaments, ointment bases, absorption of medicaments from topical bases ; lotion vehicles—cellulose derivatives, alginates bentonite, carbopol and other synthetics.

Cosmetic preparations—cosmetics for skin, eyes, hair, and the nails.

C. Equipment and organisation of.—Manufacturing pharmacy.

D. Manufacture of.—Dextran, Polyvinyl-pyrrolidone and other plasma expanders ; Carboxymethylcellulose ; synthetic detergents ; chemicals from oranges ; vitamin B₁₂.

Practical work

A. Manufacture of representatives of each class of official preparations and cosmetics ; preparation of suspending agents and gels and the study of their properties. Preparation of formulations used for disinfection, pest and insect control.

B. Manufacture of compressed tablets :

- (a) Blank tablets ;
- (b) tablets prepared by direct compression ;
- (c) tablets prepared by wet granulation method ;

- (d) tablets of materials difficult to granulate-complex formulation, buffered tablets, coloured tablets, tablets of materials unstable in air or thermolabile ;
 - (e) effervescent tablets;
 - (f) tablets prepared by double compression (slugging);
 - (g) tablet coating ; vitamin tablets;
- Disintegration test for tablets.
- C. (a) Manufacture of capsules;
 - (b) Preparation of dry extracts and a soft extract;
 - (c) Manufacture of ampules and other sterile preparations.

Reference Books

1. Cook and Martin . Remington's Practice of Pharmacy.
2. Husa : Pharmaceutical Dispensing.
3. Davis : Bentley's Text book of Pharmaceutics.
4. Greenberg, Lester and Haggard : Handbook of Cosmetic material (Interscience).
5. Niven : Industrial Detergency (Reinhold).
6. Pharmacopoeia of India.
7. British Pharmacopocia.
8. Martin : Physical Pharmacy.
9. British Pharmaceutical Code.
10. Polano : Skin Therape Atics.
11. Modern Chemical Processes Vols. III & IV. (Reinhold).

4.5. PHARMACOLOGY AND BIOSSAY

A. An introduction to the study of drugs, their pharmacological action, toxicology and therapeutics. Sources of drugs, their active principles, their standardization, and posology. Principles of posology by which doses are determined. Theories and factors affecting drug action. Quantitative methods in Pharmacology.

The study of important drugs (i) acting locally, (ii) affecting the central nervous system, autonomic nervous system, cardiovascular system, blood and blood forming organs, gastrointestinal system genitourinary system, endocrines, and (iii) used in the Prophylaxis, diagnosis, and treatment of specific diseases. Among the last named group that are of special importance are local anti-infectives, intestinal anthelmintics, amebicides, antisyphilitic, antimalarial and antitubercular drugs, the sulphonamides and the antibiotics.

B. The general study of toxicology with special reference to acute and chronic system, and the emergency treatment of poisoning resulting from overdoses of drugs from the accidental or intentional ingestion of or exposure to, toxic substances. Dangers of premature introduction of medicaments and their preparations and cosmetics with toxic potentialities.

C. The principles and procedures of bioassay, errors in bioassay procedures, and techniques used in the measurement of error. Statistical analysis of results.

Practical work

Experiments on—(i) Absorption and Excretion of Drugs on man; (ii) Drugs acting on nervous system; (iii) Drugs, action on Heart; (iv) Drugs acting on the blood vessels; (v) Drugs acting on the Gut; (vi) Drugs acting on respiration; (vii) Diuretics; (viii) Drugs acting on the uterus; (ix) Drugs acting on the eye; (x) Biological assay.

Books Recommended

1. King George's Medical College, Lucknow : Laboratory Manual.
2. Burn : Practical Pharmacology.
3. Gaddum : Pharmacology.
4. Krantz and Carr : Pharmacologic Principle of Medical Practice.
5. Clark : Applied Pharmacology.

Reference Books

1. British Pharmacopoeia.
2. The United States Pharmacopoeia.
3. The Pharmacopoeia of India.

4.6. PHARMACOGNOSY—II

A. A knowledge of the following in greater detail than that included in Pharmacognosy I :

The commerce in and history of crude drugs; (ii) systems of classification of crude drugs; (iii) cultivation, collection, preparation for the market and storage of crude drugs; (iv) the microscopical and sensory characters, biological and geographical sources, commercial varieties and adulterants and constituents of the crude drugs in frequent use in pharmacy.

B. A knowledge of the following : (i) changes occurring in drying, storage and comminution of crude drugs. The factors and organisms influencing deterioration of crude drugs; (ii) Methods used for the examination of crude drugs, the isolation and identification of tissues and cells; (iii) Microchemical tests for cell walls and cell contents; Microscopical measurements; the systematic description of crude drugs; (iv) The microscopy of drugs of organised structure in the whole, broken or powdered condition, as illustrated by cascara, cinchona, clove, cardamom, fruit, fennel, nuxvomica, belladonna herb, digitalis leaf, ginger, liquorice, ipecacuanha and pyrethrum flowers; (v) The microscopy of starches and starch products of pharmaceutical importance. The use of microscopical characters to identify drugs of unorganised structure in frequent use in pharmacy; (vi) Groups of drug constituents and their significance in pharmacy. Qualitative tests for the identification of, or the detection of adulteration in the crude drugs in frequent use in Pharmacy.

C. The types and significance of standards for crude drugs included in the Pharmacopoeia of India, the British Pharmacopoeia and the British Pharmaceutical Codex. The evaluation of crude drugs including chemical and pharmacological methods.

D. Unmedicated surgical dressings, their manufacture, structure and standards. The sources, preparation, characters, qualitative chemical tests and constituents of fibres used in the manufacture of surgical dressings.

The principles underlying the practical work of the syllabus.

Practical Work

A. Examination and description of the macroscopical characters, the general distribution of tissues, the nature of the cell walls and the cell contents of crude drugs and their reference to morphological groups.

B. Identification of, in the entire or broken condition by their gross characters and by qualitative tests, the crude drugs in frequent use in pharmacy and a knowledge of their biological and geographical sources.

C. Detection of adulteration and deterioration in crude drugs in frequent use in pharmacy.

Analysis of mixtures of crude drugs in the entire or broken.

D. Microscopic examination, identification and description of drugs mentioned in B (iv) and (v) of syllabus of theory paper. Identification of powders of crude drugs, pure or adulterated, and report on their purity. (Books will be permitted).

Microscopical measurements.

Examination, identification and report on the fibres and dressings mentioned under D of the theoretical syllabus.

Exercises on evaluation of crude drugs.

Recognition, in the entire condition, of drugs used in pharmacy or as sources of isolated active principles.

Text Books

1. Wallis : A Textbook of Pharmacognosy.
2. Wallis : Analytical Microscopy.
3. Wallis : Practical Pharmacognosy.
4. Shellard : Exercise in the evaluation of Drugs and surgical dressings (Pitman).

4.7. PRINCIPLES OF INDUSTRIAL AND HOSPITAL MANAGEMENT AND ELEMENTARY ACCOUNTANCY

A. Principles of accounting : Ledger posting and Journal entries. Preparation of Trial Balance. Columnar of Cash Book. Bank Reconciliation statement. Rectification of errors. Preparation of Profit and Loss Account and Balance Sheets. Costing, Purchase, Keeping and pricing of stock.

Treatment of cheques, bills of exchange, promissory notes and hundies. Documentary bills.

B. Principles of Economics with special reference to the laws of Demand and Supply, Demand Schedule and Demand curves. Factory Acts ; Labour Welfare ; General Principles of Insurance.

Inland and Foreign Trade. Procedure of exporting and importing goods.

C. Principles of Sales Promotion : Advertising ; Merchandising ; Window Displays. Circular letters ; Preparation and posting of literature ; Detailing.

D. Management of Hospital Pharmacy ; Retail and Wholesale Drug Stores. Stock taking and pricing of Prescriptions.

Books Recommended

1. Batliboi : First Steps in Double Entry Book Keeping.
2. Heckert and Dickerson : Drug Store Accounting.
3. Hepner : Modern Advertising.
4. McNair, Brown, Leighton, and England : Problems in Marketing.
5. Geddes : The Advertising of chemical and allied products.
6. Fredrick Benham : Economics, A general introduction (Pitman).
7. Alec Graincross : Introduction to Economics (Butterworth).

MODEL LIST
Of
BUILDINGS, EQUIPMENT AND STAFF ETC.
For
FOUR YEAR INTEGRATED DEGREE COURSE
In
PHARMACY
(Annual Intake - 30 Students)

I. Buildings

	Approximate Floor Area sq. ft.	Total Approximate Floor Area sq. ft.
A. GENERAL		
1. Head of the Department's room and office	500	
2. Staff, Laboratories and their sitting rooms	1,800	
3. Library & Reading Room	400	
4. Store Room	500	3,200
B. CLASS ROOMS		
1. Lecture Rooms—3	1,500	
2. Drawing Hall	600	2,100
C. LABORATORIES		
1. <i>Chemistry</i>		
(a) Laboratory	2,000	
(b) Balance Rooms	600	2,600
2. <i>Physics</i>		
(a) Laboratory	1,000	
(b) Optical instrument room	900	1,900
3. <i>Pharmaceutical Preparation & Pharmaceutical Engineering</i>		
(a) Laboratory (25 × 20 × 2)	1,000	
(b) Machines Room	1,200	
(c) Engineering Laboratory	1,800	4,000
4. <i>Microbiology & Dispensing</i>		
(a) Laboratory (20 × 20 × 2)	800	
(b) Sterilising room	300	
(c) Incubator & refrigerator room	300	
(d) Aseptic Laboratory	500	1,900
5. <i>Biolog.y, Physiology & Pharmacology</i>		
(a) Laboratory (20 × 20 × 2)	800	
(b) Museum	400	
(c) Demonstration	400	
(d) Animal House	400	2,000

	Approximate Floor Area sq. ft.	Total Approximate Floor Area sq. ft.
6. Botany & Pharmacognosy		
(a) Laboratory (20 × 20 × 2)	800	
(b) Museum	600	1,400
TOTAL FLOOR AREA		19,100
Add 40% for Varanda, Walls, Lavatories etc.		7,640
TOTAL PLINTH AREA		26,740
D. MAINTENANCE & WORKSHOP	600	600
Add 15% for walls etc.	90	90
TOTAL PLINTH AREA		690
GRAND TOTAL		27,430

II. Equipment

	Cost of equipment
LABORATORY NO. I	
A. General Chemistry	Rs. 7,500
B. Organic Chemistry & Pharmaceutical Chemistry	14,000
C. Analytical Chemistry	27,000
D. Physical Chemistry	10,000
	58,500
LABORATORY NO. II	
Physics	17,000
LABORATORY NO. III	
A. Pharmaceutical Chemistry	13,000

	Cost of equipment
B. Preparative Pharmacy	Rs.
(i) Main Laboratory Equipment	9,000
(ii) Machine Room	77,500
C. Pharmaceutical Engineering	57,000
	<hr/> 1,56,500
LABORATORY NO. IV	
<i>(Dispensing & Microbiology)</i>	
A. Dispensing Laboratory	16,000
B. Microbiology Laboratory	75,700
C. Biochemistry	17,000
	<hr/> 1,08,700
LABORATORY NO. V	
Physiology & Pharmacology	61,000
LABORATORY NO. VI	
Botany & Pharmacognosy	44,000
LABORATORY NO. VII	
Maintenance & Workshop	21,000
Balances for all Laboratories	12,000
TOTAL FOR ALL THE LABORATORIES	
Laboratory No. I	58,500
Laboratory No. II	17,000
Laboratory No. III	1,56,500
Laboratory No. IV	1,08,700
Laboratory No. V	61,000
Laboratory No. VI	44,000
Laboratory No. VII	21,000
	<hr/> TOTAL 4,66,700
Balances for all Laboratories	12,000
	<hr/> TOTAL COST 4,78,700
Cost of installation of equipment etc. (for installation of equipment and special services like vacuum, steam and pressure Line)	25,000
Total cost of equipment and its installation	5,03,700

III. Furniture, Library & Audio visual aids

	Cost of equipment
A. Furniture	Rs. 50,000
(for Class Rooms, Drawing Halls, Laboratory, Stores, Office, Common Room and Staff Rooms).	
B. Library	25,000
C. Audiovisual Aids	10,000
TOTAL	85,000

IV. Staff

Posts	Number
<i>A. Teaching</i>	
1. Professor	1
2. Asstt. Professors or Readers	4
3. Lecturers	4
4. Associate Lecturers	4
<i>B. Laboratory & Workshop</i>	
1. Laboratory attendants	4
2. Mechanics	3
3. Draftsman-cum-Artist	1
4. Animal House Keeper	1
5. Gardner	1
<i>C. Library, Office & Stores</i>	
1. Library clerk	1
2. Steno Typist	1
3. Typist clerk	1
4. Storekeeper	1
5. Store attendant	1
6. Peons, Watchmen & Sweepers	4

N.B.—Professor should be, either in Pharmacy or Pharmaceutical Chemistry. Assistant Professor or Reader & Lecturers may be in the following subjects:—

1. Pharmaceutical Chemistry or Pharmacy.
2. Pharmaceutics and Microbiology.
3. Organic Chemistry.
4. Physical and Analytical Chemistry.
5. Physiology and Pharmacology.

6. Pharmacognosy.
7. Pharmaceutical Engineering.
8. Physics.
9. Mathematics.

In addition, 'part-time teachers may be provided for the following subjects:—

1. Physics.
2. Mathematics.
3. Biology.
4. Languages & Humanities.
5. Commerce & Economics.
6. Engineering Drawing
7. Mechanics.

QUALIFICATION FOR TEACHING STAFF

Professor

(i) At least a Second Class Bachelor's degree in Pharmacy or Pharmaceutical Chemistry and Post-graduate or equivalent qualification in the same field.

(ii) At least 10 years teaching and/or industrial experience in responsible position.

(iii) Ability to guide research.

Readers

(i) At least a Second Class Bachelor's degree in Pharmacy or Pharmaceutical Chemistry and a post-graduate degree in the subject for which the post is advertised.

(ii) At least 7 years' teaching and/or industrial experience.

(iii) Experience in research.

N.B.—A degree in medicine or a post-graduate degree/diploma in Physiology or Pharmacology may also be considered for Readership in Physiology and Pharmacology.

Lecturer

(i) At least a Second Class Bachelor's degree in Pharmacy or Pharmaceutical Chemistry and a post-graduate degree or equivalent qualification.

(ii) At least 3 years' teaching and/or industrial experience.

(iii) Research experience will be considered as an additional qualification.

Associate Lecturers

At least a Second Class Bachelor's degree in Pharmacy or Pharmaceutical Chemistry.

V. Working Expenses Per Year (Recurring)

	Rs.
1. Chemicals, Glassware, Hardware, and other consumables, apparatus, power, light, water, @ Rs. 200 per student (200 × 150)	30,000
2. Library, books and journals	5,000
3. Contingencies, office expenses T.A., etc.	2,000
TOTAL	37,000
4. Part-time staff—10% of the expenditure on Full-time staff.	

Detailed List of Equipment for Four-Year Integrated Degree Course in Pharmacy

	Cost of Equipment
LABORATORY I	
	Rs.
<i>A. General Chemistry</i>	
1. Electrical constant temp. oven (2)	,0000
2. Muffle furnace	,0000
3. Hardware	,5000
4. Special apparatus	,0000
	7,500
<i>B. Organic Chemistry & Pharmaceutical Chemistry</i>	
1. Miscellaneous apparatus (non-glass ware)	,0000
2. Melting point apparatus	8000
3. Hyvac pump	,5000
4. Microscope	,2000
5. Hot plates, electrothermal	,0000
6. Electric stirrer	,5000
7. Refrigerator	,0000
8. Electric ovens (2)	,0000
	14,000
<i>C. Analytical Chemistry</i>	
1. Fluorimeter	,0000
2. PH Meter	,0000
3. Refractometer	,0000
4. Polarimeter	,0000
5. Potentiometric titration apparatus	,0000

	Cost of Equip- ment
	Rs.
6. Photoelectric calorimeter	3,000
7. Hot air oven	2,000
8. Muffle furnace	3,000
9. Visual Calorimeter	1,000
	27,000

D. Physical Chemistry

1. Special glassware and minor equipments	7,000
2. Potentiometer, batteries, battery charger (standard cells, voltmeter etc.)	1,000
3. Lovibond comparator	2,000
	10,000

LABORATORY II

Physics

1. Determination of viscosity	300
2. Searle's surface tension apparatus	100
3. Surface tension by capillary rise	350
4. Experiment on Heat	350
5. Experiments on Light	1,500
6. Experiments on Magnetism and Static Electricity	800
7. Optics and elementary spectroscopy	600
8. Optical bench Advanced with accessories	1,500
9. Resolving power of a telescope or mic- roscope	1,000
10. Photographylime and band spectra	1,800
11. Nuclear physics, electrical measure- ments and general electro-chemistry experiments	300
12. Comparison of E.M.F.	600
13. Experiments with Galvanometer	2,000
14 (a) Determination of the characteristic of a Diode	} 800
(b) Determination of the characteristic of a triode	
(c) Determination of the characteristic of a pentode	
15. Elementary expts. with C.R.O.	5,000
	17,000

Cost of
Equip-
ment

LABORATORY III

A. *Pharmaceutical Chemistry*

1. Ground glass apparatus	7,000	
2. Other apparatus	3,000	
3. Refrigerator or deep freeze	3,000	
		13,000

B. *Preparative Pharmacy*

Equipment	No. of Units	Cost Rs.	
*** (i) <i>Main Laboratory.</i> (ii) <i>Machine Room</i>			
Disintegrator	1	2,000	
Ball Mill	1	1,000	
Drug mill—Reymond Mill	1	1,500	
Laboratory Mill	1	3,000	
End runner	1	2,000	
***Percolaters glass	16	1,200	
Hot air oven (electrical)	2	4,000	
Shaking machine	1	1,000	
Glass vacuum still (1 gallon).	1	1,800	
Standard sieve set	1	1,000	
			9,000
Test sieve operator	1	1,000	
Laboratory sifter and mixer	1	1,500	
Kneading and mixing machine	1	2,000	
Powder mixer	1	2,000	
Mixer for emulsion and liquids	1	1,500	
Blender	1	1,000	
Homogeniser (collord mill)	1	4,000	
Ointment mill	1	2,000	
Triple roller mill	1	2,500	
Paste mill	1	3,000	
Collapsible tube filling equipment	1	1,000	

Equipment	Number of units	Cost
		Rs.
Drying oven electrically heated with air circulation	1	4,000
Granulator	1	3,000
Vacuum drying oven	1	5,000
Tablet machine (Hand)	3	3,000
Tablet machine (Motor driven)	1	2,000
Sugar coating pan	1	1,500
Polishing pan	1	1,500
Hardness testing machine	1	500
Disintegration test machine	1	1,000
Soxhlet extractor and Vacuum evaporator stainless steel	1	2,000
Evaporating pans (stainless steel) and acid resisting	2	3,000
Basket centrifuge	1	3,000
Filter press (Plate & Frame and one other type)	2	3,000
Tincture press (double action)	1	500
Suppository machine	1	500
Marorecovery still	1	1,000
Essential oil still	1	2,000
Centrifugal separator	1	5,000
Manesty still	2	4,000
Stainless buckets, jugs etc. . . . .	..	1,000

77,500

C. *Pharmaceutical Engineering*

1. Venturimeter	1,000
2. Rotameter	2,000
3. Weires & Pipe Fittings	1,000
4. Centrifugal pump & motor with energy meters	4,000
5. Jet pumps	2,000
6. Jacketed pan	1,000
7. Steam kettle	1,000
8. Pyrometers	2,000
9. Thermocouples with potentiometer and other accessories	4,000
10. Compressor	5,000
11. Vacuum pump	5,000
12. Gas analysis apparatus	4,000

Equipment	No. of units	Cost
		Rs.
13. Screens (complete sets)		2,000
14. Distillation column, glass packed		2,000
15. Evaporator, double pipe heat exchanger		3,000
16. Drier (vacuum shelf)		5,000
17. Filtration equipment		5,000
18. Gas absorption equipment		3,000
19. Film dryers		5,000
		57,000

LABORATORY IV

*Dispensing & Microbiology**A. Dispensing Laboratory*

Pill machine	} 5 sets	1,000		
Pill rounders				
Pill coater				
Suppository moulds 15 grain } Suppository can and bath } Suppository moulds 30 grain } Suppository moulds torpedes . }	} 5 each	2,000		
Passery moulds				
Tablet titurate moulds (ebonite with double tops 1/2 & 1 gr.)			} 5 sets	1,000
Hand capsule filling machines				
Hand capsule filling machines	5	2,000		
Pastile moulds with tray	5	500		
Lozenges Board and Cutters	5	500		
Power Folders	15	500		
Ointment slabs and spatulas	15	500		
Dispensing balance (with) weights	15	500		
Pestle and mortars	30	500		
Shop rounds, glass apparatus and other minor items	15	5,000		
Autoclave (Prestige pressure cookers)	20	2,000		
		16,000		

B. Microbiology Laboratory

Refrigerator	3,000
Aircondition plant	10,000
Autoclaves	6,000
Hot air steriliser	2,000

Equipment	Number of units	Cost
		Rs.
Steriliser for surgical dressings		3,000
Incubators - $-37^{\circ}+50^{\circ}$		6,000
Ampoule filling machine		3,000
Ampoule sealing machine		500
Pyrogen testing equipment.		3,000
Colony counter		500
Meat mincer		500
PH comparator with discs		1,000
Bacterial filters different types		2,000
Electrical constant temperature water baths (with test tube holder)		2,000
Demineralizer		2,000
Distillation apparatus for pyrogen free water metal and glass		2,000
Air compressor		5,000
Microscopes—	8	12,000
Boxes for petri dishes & pipettes		400
Glass Cabinet		600
Heating mantles		400
Hot plates		500
Stainless steel table	4	2,000
Syringes (5, 10 ml.)	4	100
Shaker Rotary		2,000
Stirrers		1,000
Thermometers		200
Vial sealing machine		1,000
Vacuum pump		2,000
Zone reader		1,500
Electric geyser	2	500
		75,700

Equipment	Number of units	Cost
		Rs.
<i>C. Biochemistry</i>		
1. Electrical centrifuge—speed 6,000 R.P.M. with variable speed heads and accessories G.E.C. International		9,000
2. Planimeter		300
3. Automatic fraction collector .		4,000
4. Densitometer		2,500
5. Ultraviolet lamp with glass filters		1,200
		17,000

LABORATORY V

Sl. No.	Name of the Apparatus	Number	Cost
			Rs.
<i>A. Physiology & Pharmacology</i>			
1	Kymograph unit with respiration pump, operation table, smoking unit, surgical instruments, electronic stimulators, oncometers, manometers, time-markers, perfusion sets, and other accessories	1	10,000
2	Assembly for obtaining simple muscle twitch, and additional equipment like stands, clamps, pulleys, weights, levers, smoking unit, varnishing trays etc.	10 sets	10,000
3	Isolated organ baths, special levers, oxygen cylinders, constant temperature water-bath, special electordes etc.	8 sets	5,000
4	Microscopes and lamps	4	6,000
5	Microtome and allied equipment for histological work	1	4,000
6	Equipment for haematological work like haemocytometers, haemoglobinometers, etc.		2,000

Sl. No.	Name of the Apparatus	Number	Cost
			Rs.
7	Models, charts, museum jars and stands for these . . . .	..	4,000
8	Animal house equipment for keeping frogs, rabbits, rats and guinea pigs . . . .	..	5,000
	<i>B. Airconditioning</i>		
9	Block pressure apparatus, spirometer, ergograph, sphygmograph, B.M.R. apparatus, centrifuge and other clinical physiology and pharmacology equipment for demonstration . . . .	..	10,000
			<u>61,000</u>

LABORATORY VI

Botany & Pharmacognosy Laboratory

Equipment	Number	Cost
		Rs.
Microscopes	8	12,000
Photomicrographic attachment with lamps	1	1,500
Fluorescence microscope	1	2,500
Dissecting microscopes	15	2,000
Microtome with accessories	1	4,000
Microscope lamps	15	2,000
Polarising filters & analysers	10 sets	2,000
Microscopic drawing equipment	15	7,000
Stage and eye-piece micrometers	10 sets	2,600
Pointer eye-piece & demonstrating eye-piece . . . . .	..	400
Museum and herbarium (including 10 cupboards) . . . . .	..	5,000
Charts	100	3,000
		<u>44,000</u>

LABORATORY VII

Equipment	Cost
<i>Maintenance & Workshop Equipment</i>	
Lathe	8,000
Drilling machine	3,000

Equipment	Cost	
	Rs.	
Machine saw	3,000	
Grinder	2,500	
Welding set	1,500	
Hand tools including electrical and machine tools	3,000	
	21,000	
Balances for All laboratories .	12,000	12,000

N.B.—The fact, that certain equipment is indicated in a particular section does not preclude its use by the other section wherever necessary.

ANNEXURE XVII

(Addendum to Item No. 7)

Report of the Standing Committee of the Eastern Regional Committee

As per earlier directive of the Regional Committee, a meeting of the Standing Committee was held on Friday the 26th May, 1961 at 11 A.M. in the Eastern Regional Office of the Ministry of Scientific Research & Cultural Affairs, 5 Esplanade East, Calcutta-1 with Shri N. K. Mitra in the Chair. Other members present were—

Shri B. N. Chaudhury Member.

Shri N. C. Chakraverty Secretary.

Principal A. C. Roy and Dr. T. Sen expressed their inability to attend the meeting due to other urgent engagements.

The Committee examined in detail the progress reports of all the polytechnics in the eastern region (copy enclosed as per Appendix "A") *viz.*, three in Assam, eight in Bihar, five in Orissa and twelve in West Bengal and Muzaffarpur Institute of Technology (College of Engineering). Some of these polytechnics have been established during the second Five Year Plan. Except two institutions, *viz.*, the Schools of Engineering at Gaya and Purnea, all the other polytechnics have been visited either by the Secretary or by the Expert Committee. The progress of development had been very slow in most of the institutions especially during the second Five-Year Plan. In some of the institutions, though the expenditure on buildings and equipment are satisfactory, the actual utilisation of the buildings and equipment could not be made, as the buildings are incomplete. Equipment though received are not erected in its proper place. The number of staff actually working is far below the strength required for the intake according to the recommendations of the Eastern Regional Committee. The Committee, however, points out the cases of the following institutions in the different States of this region where immediate action is required to be taken. The institutions are—

BIHAR

1. Darbhanga School of Engineering, Darbhanga.
2. Dhanbad Polytechnic, Dhanbad.
3. Muzaffarpur Institute of Technology, Muzaffarpur. (Engg. College).
4. Schools of Engineering at Purnea and Gaya.
5. College of Engineering, Bhagalpur.

ORISSA

6. School of Engineering, Kendrapara.

WEST BENGAL

7. Purulia Polytechnic, Purulia.

The present position of these institutes are given in the following paragraphs :

BIHAR

1. *Darbhanga School of Engineering, Darbhanga.*—This institute was started in December, 1959. In spite of the fact that the Regional Committee recommended not to admit students before July, 1960 and that also after the Expert Committee had certified that the minimum facilities had been provided, admission to this institute was made in a great hurry in December, 1959 immediately after the Regional Committee's meeting at the end of September and before the recommendations were even submitted to the Co-ordinating Committee in its meeting held on 1st March, 1960.

The Expert Committee visited the institute in July, 1960. The institute is housed in an old building which was originally a Library of the Darbhanga State. The three rooms in this building were being utilised by 180 students admitted in December as well as 60 students of the Industrial Training Institute. One of the rooms is fitted as Workshop for the I.T.I. students, the other two rooms being used by the polytechnic for its lecture class and drawing class, there being no provision for Physics or Chemistry laboratories. This Expert Committee recommended after the visit that no new admission should be made in the institute till it was shifted to a new site. The staff position at that time denoted vacancies as high as 80%.

The institution, however, disregarded all the recommendations of the Expert Committee and in spite of lack of facilities admitted another batch of 180 students in July, 1960. The chairman of the Regional Committee has also drawn the attention of the Chief Minister of the State to take necessary steps for improvement of the institute, but no action was taken either to improve the condition or reduce the strength of the students admitted. The students of this institute went on strike drawing the attention of the authorities to the lack of facilities and accommodation in library, equipment and workshop. The Principal of the institute in his letter dated 22nd May, 1961, has reported that the institution continues to be run in the same state as before and also informed that as a result of the students' strike, the State Government has recently sanctioned the construction of temporary workshop and laboratory sheds. It is not known when these temporary structures will be made available. With the third batch of students about to be admitted in next July, no steps had, yet been taken nor even land acquired for construction of permanent buildings or provision of necessary equipment or staff.

The institute has actually six full-time members of the staff and three part-time teachers against a sanction of requirement of twenty-one numbers of teaching staff for first and second years only. The position obviously is serious. If it is not practicable to stop new admission entirely in July, 1961, only a nominal number may be admitted in civil engineering only and vigorous steps should at least be taken by the State Government in order to provide workshop and laboratory facilities. Unless this is done, students already in the school and those who may be admitted, will never be able to make up to come to the required standard.

2. *Dhanbad Polytechnic, Dhanbad*—The Secretary visited the institution on 30th November, 1960. The institution was started in 1958. The sanctioned intake is 240 in civil mechanical and electrical engineering. The total strength of the students in first, second and third year is 680. In addition to the above students, there is an Industrial Training

Institute with about 60 (sixty) students in the same campus and the principal is incharge of this also. The Mining Institute, Jharia is also situated in a portion of the same building. Workshop buildings have just been completed. Though electrification is under way. Except for carpentry and fitting shops, there are no facilities in workshops and laboratories. A few items for the smithy and machine shops have just been received and are being erected. No facilities in other workshops like foundry, physics, chemistry and material testing, heat, engines and electrical engineering laboratories are available, though all the three classes in the three branches of engineering are in existence and the students will be appearing at the final examination in 1961.

The staff position in December, 1960 is very deplorable, as will be seen from the following table:

	Approved	In position on 30-11-60
1. Principal	1	1
2. Asstt. Profs/Lecturers (Engg.)	26	8
3. Asstt. Prof. (Sc. Maths & Humanities)	7	2
4. Foremen	2	1
5. Instructors	10	Nil.

From the above, it will be clear that the institution which is in the third year and conducting all the three courses and has got the full complement of students, has only about 25% of the approved teaching staff. Equipment available is meagre even for the first year students of the polytechnic. On the whole the position is highly unsatisfactory and needs immediate attention of the State Government. The Standing Committee recommends that admission to this institute should immediately be stopped till the laboratories have been fully equipped and the vacancies in the staff filled up.

3. *Muzaffarpur Institute of Technology, Muzaffarpur (Engg. College).*—The Expert Committee visited the college (established in 1954) in July, 1960. The Committee noted that except the construction of the building and the hostel which was completed about a year back, no progress has been made in the erection of machineries and equipment in the workshop and laboratories. The only progress that appears to have been made in the last one year is the completion of electrical connection in the main building. Though several batches of students have already graduated from this college, no serious attempt appears to have been made in providing the physical facilities to the students. It is understood that some machineries and equipment have been purchased, but nothing has been done for the utilisation of the same by its erection in its proper place. Most of the rooms are empty. The Committee strongly felt about the lack of progress and

recommended that immediate steps should be taken to equip the laboratories and workshop by appointing additional staff, if necessary. The position of the staff of the institute on 30-5-61 is as under :

	Recom- mended	In posi- tion on 30-5-61
Principal	1	1
Professors	3	3
Assoc Prof./Readers	10	Nil.
Asstt. Profs./Lecturers	34	9
Workshop Superintendent	1	1
Foremen	2	Nil.

It will be seen that the staff position is also very unsatisfactory.

The Committee feels that admission to this college should be restricted to Civil Engineering only till the workshops and laboratories are completely fitted up.

The Standing Committee completely endorsed the view of the Expert Committee and recommended that admission to this college should be restricted to sixty in Civil Engineering only.

The Regional Office has recently received a scheme for increasing the intake of the college from 120 to 180. In view of the fact that the present facilities are completely inadequate for the students, already admitted, no steps should be taken by the State Government to increase the strength until the position has been consolidated by fitting up of all the laboratories, construction of additional accommodation already recommended under the Expansion Scheme and most important of all the appointment of full complement of staff recommended.

4. *Schools of Engineering at Purnea and Gaya.*—It is understood that the School of Engineering which was started at Purnea in 1959 is almost in the same condition as Dhanbad Polytechnic. Similar steps recommended for the Dhanbad Polytechnic should also be adopted for School of Engineering, Purnea. It is also understood though detailed information from the State Government is lacking that a polytechnic had been started at Gaya with 180 students with practically no physical facilities and teaching staff.

5. *College of Engineering at Bhagalpur.*—It is understood that a College of Engineering has been started on the 1st December, 1960 at Bhagalpur. In spite of the recommendation of the Planning Commission to the contrary, no sanction from the Regional Committee or A.I.C.T.E. has been obtained before starting of the college. It is not known also what physical facilities have been provided. The Standing Committee feels that establishment of such an institution without prior sanction and without provision of minimum facilities, is highly detrimental to the cause of technical education.

ORISSA

6. *School of Engineering, Kendrapara.*—Establishment of this School was recommended by the Eastern Regional Committee in September, 1959

and approved by the Co-ordinating Committee in April, 1960. The school was accordingly started with the permission of the Government of Orissa in July, 1960 and sixty students were admitted in August, 1960. The Expert Committee visited the institution on the 24th April, 1961. They found the position as under :

Nothing practically has been done regarding the preparation of the site, planning and construction of the buildings or ordering of equipment. The School is being run in two rooms of the local Arts College which was also started in April last year. The staff consisted of one Workshop Superintendent, a Graduate of the Jadavpur University and two part-time teachers from the Arts college for teaching Mathematics and Humanities. No Principal has been appointed though the institute was started a year back. The Arts College having no Physics or Chemistry laboratories, the students do not have any facility for learning the subjects. How the students admitted are being given theoretical and practical training required for the first year is beyond our conception. The Expert Committee recommended that—

the management of the institute should be taken over by the Government.

site plan earmarking the land for the School and its hostel should be prepared immediately and detailed plans of the buildings, etc. should be submitted to the Regional Committee.

no further admission should be made in July next.

a qualified Principal should be appointed together with the minimum teaching staff required for the first and second year classes, as enumerated in the Expert Committee's report.

The Standing Committee fully supports the recommendations of the Expert Committee *viz.*,

(a) a qualified Principal should immediately be appointed.

(b) this school should not be allowed to admit any more students in July, 1961, as it is practically impossible to provide any better facility within a couple of months.

In order that the students already admitted may continue their education arrangements may be made to provide instruction in other institutions of the State or temporary structures as recommended by the Visiting Committee may be put up and equipment borrowed from other institutions. Appointment of necessary staff be made immediately.

This is a case that should be taken up immediately.

WEST BENGAL

7. *Purdia Polytechnic, Purdia.*—Though the institute was established in 1957 and is at present running all the classes in civil, mechanical and electrical engineering in the first, second and third year, the number of teaching staff including Principal is only six against a sanctioned strength and requirement of twentyseven. According to the latest report of the Principal, there are no staff for teaching Physics, Chemistry and Mathematics. Though the buildings are complete, due to the absence of electricity, the machinery and equipment received could not be put into operation. There are no facilities for practical training in heat engines, electrical engineering, workshop practice etc. The students have also made several representations regarding the lack of facilities.

The Standing Committee took a serious view of the tendency of the State Governments to permit the admission of students without providing the necessary physical facilities which is highly detrimental to the students of the institute.

The Committee recommends that the admission strength should be limited to 90 students in 1st year. Full arrangements are to be made to equip the laboratories with proper machineries, provide electricity and water and immediately employ proper qualified staff as per recommendations of the Expert Committee.

Summarising, the Standing Committee's recommendations for the above institutions are the following:

I. (a) *Darbhanga School of Engineering, Darbhanga*

Only sixty students in Civil Engineering are to be admitted in July, 1961.

Additional staff required should be appointed before July, 1961, till the buildings and workshops, etc. are completed and fully equipped.

(b) *Dhanbad Polytechnic, Dhanbad*

Admission strength should be stopped from July, 1961 till the laboratories are fully equipped and the vacancies of staff are filled up.

(c) *Muzaffarpur Institute of Technology Muzaffarpur (Engg. College)*

Admission should be restricted to sixty students in Civil Engineering, only till the workshops and laboratories are completely fitted up. Under no circumstances, increase in intake in this college should be permitted till the position has been consolidated by fitting up all these laboratories, construction of additional accommodation recommended and full complement of staff appointed.

(d) *Schools of Engineering at Purnea and Gaya*

Admission should be restricted in a similar way to that of Dhanbad Polytechnic.

(e) *College of Engineering, Bhagalpur*

The college should be closed, the students transferred to some other college and no new admission permitted till the necessary buildings, equipment and staff had been provided.

(f) *School of Engineering, Kendrapara*

Further admission in 1961 to be closed and the student transferred to some other institution till the buildings, equipment and necessary staff are provided.

(g) *Purulia Polytechnic, Purulia*

Admission strength should be limited to ninety students in first year from July, 1961. Immediate arrangement to be made to equip the laboratories, provide electricity and water supply and appoint proper qualified staff.

II. The standing Committee also appointed a Sub-committee consisting of the Secretary of the Eastern Regional Committee and any one of the following members:

1. Dr. T. Sen, Rector, Jadavpur University, Calcutta-32.
2. Shri A. C. Roy, Principal, B.E. College, Sibpur.
3. Shri B. N. Chaudhuri, Ballardie, Thompson & Mathews, Calcutta.

The Sub-committee should periodically visit the various technical institutions in the region and report to the Standing Committee about the progress of development of institutions.

(Sd.) N. K. Mitra.

(Sd.) B. N. Chaudhuri.

(Sd.) N. C. Chakraberty.

DATED CALCUTTA, THE 8TH JUNE, 1961.

APPENDIX 'A'

Present position of Polytechnics in the Eastern Region

Name of the Institution	Year of Estt.	Intake			Teaching staff						Approved Expenditure			Progress of Expenditure			Remarks position as on.
		Sanctioned	Actual 60	Total strength	Approved			Existing			Bldg.	Eqpt.	Hos- tel	Bldg.	Eqpt.	Hos- tel	
					LE	LG	F	LE	LG	F							
					6	7	8	9	10	11	12	13	14	15	16	17		18
<i>Assam</i>																	
1. Assam Engg. Inst., Gauhati.	1948	180	180	355	18	7	2	18	1	2	N. 1.26 E. 4.93	2.10 4.50	0.96 ..	1.26 Nil	2.10 4.04	0.96 ..	Building started.
2. H.R.H. Prince of Wales Instt. of Engg. & Technology, Jorhat.	1954	180	177	408	23	5	2	11	4	1	N. 0.56 E. 7.80	0.62 6.30	1.80 4.93	0.56 1.56	0.62 6.30	1.97 1.77	
3. Silchar Polytechnic, Silchar.	1960	120	60	60	12	4	2	2	2	1	7.33	7.55	4.43	Nil	..	..

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>Bihar</i>																			
1. Dhanbad Poly., Dhanbad.	1958	240	240	680	29	6	2	6	4	1	12.31	12.35	..	0.14	0.39	..		31-3-59	
2. Ranchi School of Engg., Ranchi.	1954	180	180	582	18	6	2	12	3	2	N. 2.58 E. 4.50	2.23 5.00	1.77 4.23	0.73 0.50	2.08 2.05	..	..	31-3-58 31-3-59
3. Bhagalpur School of Engg., Bhagal- pur.	1955	180	65	183	18	6	2	..	..	..	2.95	2.23	2.11	4.07	2.33	..		30-9-59
4. Tirhut School of Engg., Muzaffar- pur.	1949	180	100	200	18	6	2	10	Approved recently.								
5. Patna School of Engg., Patna.	1949	180	180	343	18	6	2	1	1	..	9.78	9.50	6.81	} Not available.					
6. Darbhanga School of Engg., Darbhanga.	1959	180	180	351	18	6	2	5	1	..	8.63	9.00	6.55						
7. Purnea School of Engg., Purnea.	1959	180	180	350	18	6	2	2	1	..	8.63	9.00	6.55						
8. Gaya School of Engg., Gaya.	1960	180	195	..	Not available						8.63	9.00	6.55						
<i>Orissa</i>																			
1. Orissa School of Engg., Cuttack.	1923	180	195	..	18	6	2	12	4	..	N. 0.29 E. 1.89	1.79 1.35	5.82 2.11	.. 0.17	.. 0.99	9.25 0.45		30-9-60	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
2. Engineering School, Jharsuguda.	1955	180	95	354	18	6	2	7	5	2	N. 3.40 E. 5.31	3.25 5.85	2.47 4.22	3.13 0.91	2.06 0.43	4.38 3.79	30-6-60 30-6-60	
3. Berhampur School of Engg., Berhampur (Ganjam).	1956	180	180	..	18	6	2	12	3	2	N. 3.72 E. 5.31	3.40 5.85	2.10 4.20	3.72 0.94	2.63 ..	2.10 ..	31-3-60 30-6-60	
4. School of Engg., Bhadrak.	1958	180	37	253	18	6	2	5	2	1	9.80	11.00	6.34	6.11	2.28	4.61	31-3-61	
5. Kendrapara School of Engg., Kendrapara.	1960	120	60	60	12	4	2	1	3	..	7.33	7.55	4.43	Not available			21-4-61	
<i>West Bengal</i>																		
1. Ramakrishna Mission Shilpa- mandira, Belur.	1954	180	191	524	18	6	2	18	6	2	N. 4.77 E. 3.55	4.39 2.03	5.10 ..	6.019 8.31	4.451* 1.05	4.92 ..	*Hostel complete Original & Expn.	
2. Jadavpur Poly., Jadavpur.	1952	180	202	561	16	6	2	21	6	..	N. 2.96 E. 1.26	2.56 0.68	5.60 ..	3.41 1.14	2.50 0.58	5.60 ..		
3. M.D.C. Institute of Engg., & Tech. Burdwan.	1893	180	180	540	Not known						..	N. 1.78 E. 2.84	2.16 2.03	3.78 ..	1.81 2.50	2.17 0.96	3.89 ..	No reply.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
4. K. G. Engg. Institute, Vishnupur	1949 1951	180	176	505	18	6	2	16	5	1	N. 0.97	1.383	1.21	0.97	1.33	1.21		
											E. 5.94	5.85	4.50	5.46	4.80	..		
5. Jalpaiguri Polytechnic Instt., Jalpaiguri.	1950	180	180	455	19	5	2	17	6	2	N. 1.28	1.34	1.55	1.28	1.30	1.60		
											E. 5.94	5.84	..	5.61	4.81	..		
6. Hooghly Institute of Tech., Hooghly.	1930 1951	180	177	294	16	6	2	14	6	..	N. 1.87	1.30	1.05	1.85	1.30	1.05		
											0.72	0.92	1.10	0.62	0.88	..		
											E. 5.94	5.85	*2.48	5.44	5.34	..		*Loan recommended.
7. B. P. C. Institute of Tech., Krishnagar.	1956	180	182	384	18	6	2	10	5	1	N. 2.84	2.08	2.11	2.75	1.93	2.11		
											E. 4.05	4.50	..	3.77	4.43	..		
											2.05	1.87	..	..	..	..
8. Shree Ramakrishna Shilpa Vidyapith, Suri.	1955	120	124	236	12	4	2	8	4	1	N. 2.84	2.10	1.50	2.23	2.30	1.52		
											E. 4.36	5.32	..	..	..	..
9. Jhargram Polytechnic, Jhargram.	1957	180	158	456	15	2	2	12	5	2	9.80	11.00	..	9.52	5.40	..		
10. Purulia Polytechnic, Purulia.	1957	180	107	304	18	6	2	5	5	1	9.80	11.00	..	10.82	2.39	..		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
11. Murshidabad Institute of Tech- nology, Berham- pur. (W.B.).	1957	180	150	424	18	6	2	12	6	2	9.80	11.00	..	8.80	3.53	..	
12. Ramakrishna Mission Shilpa- pith, Belghoria.	1958	180	201	503	18	6	2	16	6	2	9.80	11.00	..	9.81	7.10	..	

LE—Lecturers in Engineering.

LG—Lecturers in Science & Humanities.

F—Foreman.

N—Normal Scheme.

E—Expansion Scheme.