V. Maintenance and Management Plan

(1) System of maintenance and Administration

Maintenance for equipments is roughly classified into preventive maintenance and corrective maintenance. Preventive maintenance should be done for prevention of malfunction and for keeping property function and is classified into Quality Control, Clean-up, Check-out Difacement, Oiling, Replacing of Worn-out Parts and Adjustments.

It is necessary to keep preventive maintenance, daily, weekly, monthly or periodicaly, and operaters or staff, who are well-trained for it, should be assigned in hospital.

Preventive maintenance concerned technique is not different for the applied equipments and statistical method should be applied. The persons who are educated as doctors and as laboratory technicians are able to put the suitable methodology for each equipments into effect.

The equipments selected in this Project are as simple and strongly-built as possible. For mechanical or electrical maintenance, therefore, the persons, who are in charge of handling or nominated as responsible persons for maintenance,have abilities of maintainance the equipments with the operation manual.

For corrective maintenance, maintenance division is planned to be establised in the Institute. This time, measuring machines and tools are to be provided with spare parts. By this provision the maintenance activity will become more smoothly. For large-sized equipments Japanese manufactures have their agents in India, where repairing engineers are arranged to render maintenance services. However, in order to get permanent maintenance services, to conclude service contracts with agents is recommendable, so as to get periodical inspection of 1-4 times per year, and repair and replacement of parts. These services shall prolong the life-time of equipments for twice or three times as usual, decrease the accidental failure and guarantee normal operation.

The term of guarantee of Japanese equipments concerned with the supply of spare parts is usualy seven years and shorter than in India. However in this Project, supplier shall be forced to guarantee the above term for ten years in accordance with the condition of the tender.

1) Blue Star Ltd.

The Company has 3500 staff. Their head office is located in bombay and their branch office is in New Delhi. In this July, they intend to arrange their engineer in Lucknow. The company has divisions of air-conditioning, electronics, industries and equipments. They have a factory for air-conditioner and produce equipments. In the field of medical equipments deal mainly X-ray apparatus and ultrasound diagnostic apparatus of Hitachi in the department of electronics. They also deal devices of Technicon and Hewlett Packard (HP) but not of Hitachi regarding laboratory equipments. 27 technicians have been arranged for X-ray apparatus and render services for 21 CT scanners and 30 ultrasound diagnostic apparatus produced by Hitachi. As for laboratory equipments 17 technicians render services for 8 apparatus of lch. multi-autoanalyser, 6 of multi-sincronized autoanalyzer and 8 of lch. autoanalyzer. Regarding their style of field services, usually exchanges of basis of electronics are provided first of all and as for wrong parts of basis, they are brought back and repaired in the workshop, so that loss time may be reduced. In the workshop they possess advanced measuring machines as well as advanced techniques.

2) Toshniwal Brothers

They produce measureing machines such as oscilloscope and recorders etc., While their head office is located in Bombay, their branch office is New Delhi. A technician is allocated in Lucknow. They are an agent of Shimazu Corp. and JEOL. They mainly deal analyzers of Shimazu Corp., but only few X-ray apparatus of Shimazu.

As for analysers, they have 310 of spectrophotometer, 89 of gaschromatograph, 17 of fluorophotometer, 17 of thermometric analysers, 5 of particle analysers, 6 of TLC chromatograph Scanner, 21 of analitical balance, 39 of infrared spectrophotometer and 22 of atomic absorption spectrophotometer.

As for X-ray apparatus, 8 of portable X-ray apparatus, 5 of angiograph, 4 of CT scanners, 19 of ultrasound diagnostic apparatus.

Regarding CT scanners above mentioned, the equipments were provided by grant aid of Japanese Government. Technicians for them are being still trained in Japan and the equipments have not been installed

yet. Regarding devices of JEOL, they have sales records of 55 of electronics microscope, 27 of NMR analyser, etc.. In total 30 technicians are arranged in order to cover maintenance services for the above equipments. 12 of them have an experience of training in Shimazu Corp.

Regarding their style of field services, exchanges of parts are provided usually and in case the repair of equipments seems to be impossible at the site, these equipments are brought back and repaired in the work shop. In the work shop only basic measuring machine such as, oscilloscopes and testers, are arranged but they do not seem to have a high performance enough to find the wrong parts immediately. The present condition of their after services is supposed to be insufficient. Since, they have only few stocks of basis of electronics and have a lot of loss time.

3) United Diamonds

United Diamonds Ltd. is composed of divisions of construction, architectural designing, industry, precision machinary industry and laboratory center. They belong to United Groups. In the division of precision machinary industry they produce watches, jewels, televisions and medical equipments. In New Delhi they have a head office as well as a branch office. In Lucknow they have their laboratory center, where a technician is allocated.

Regarding medical equipments, they produce CT scanners and ultrasound diagnostic apparatus of Toshiba on the knockdown basis. On the other hand they produce CT scanners of United Groups. Most of the produced medical equipments are distributed to their own laboratory centers, but they began to sale them outside customers from this February. Although they received the order of 5 CT scanners, those equipments have not been installed yet.

According to their service system, one technician is allocated in each of 30 laboratory centers. Since each center possesses basic stocks of basis of electronics, each center can give field services to customers.

4) Shibumi Medical

The company is composed of a president, 2 salesmen, 4 technicians, 2 clarks and 9 staff in total. It is established as an agent of Japanese manufactures. The main office is located in Babalone and they have a branch office in Delhi in future. The company deal equipments of Nihon Kohden, Mitsubishi and Toshiba. Especialy they delivered ECG and other equipments of Nihon Kohden to 39 customers.

5) Foreign Agents

In the field of medical equipment Siemens India Ltd. have the advantages of others and have 5 branch offices in India. Second position is occupied by Philips and its agent is PEICO Electronics. GE has its branch office in Bombay.

Table 17 : MAIN AGENTS IN INDIA

Agents \ Maker	Hitachi	Shimadzu	Toshiba	Mitsubishi	Nihon Denshi	Nihon Kohden	Nippon Denki Sanei	Olympus	Shiemens	Philips	Technicon	H P
Blue Star Ltd.	○										○	○
Toshniwal		○			○							
United			○									
Shibumi Medical			(○)	○		○						
Systems Laboratories							○ BOMBAY					
Intercardio							○ DELHI					
Mitra								○ endo-scope				
Netaji Subbash								○ micro-scope				
Peico										○		
Shiemens India									○			

(2) Expense for Maintenance and Administration

Expense for maintenance and administration is divided into running cost for daily maintenance and cost for upkeep and corrective maintenance of equipment.

Regarding running cost, it includes costs for operator (personell) and costs of reagents and consumables (thing). Since the equipment mostly is operated by doctor and nurses, for introduction of equipment new staff seems to be not necessary.

When equipment is installed reagents and consumables are attached to it for the time of 1-2 years. After that time the necessary amount will be required (Table 18). Running cost for electricity and water is also required (Table 19).

Table 18 Expenses for reagents and consumables

Reagents (Thous/Year)	Consumables (Thous/Year)
110,735	279,877

* Expenses were estimated from consumptions based on required amounts of workload.

Table 19 consumption for electricity and water

Electricity (KWH/Year)	Water (m^3/year)
505,874	649

* Consumptions were estimated based on required amounts of work load.

Regarding cost for upkeep and corrective maintenance of equipment, the Institute is requested to include the cost in their budget.
The costs are estimated as follows:

1) Daily upkeep cost 28,083 thons Yen
* Costs for consumables, cleaning materials and oils are included, but cost for reagent and consumables.
** 1% of equipment's cost is estimated.

2) Cost for maintenance contract 190,627 thous. Yen

* The contract is necessary, regarding equipments for laborarory and radiology, which is requested urgently.

** 10% of objective equipment's price, plus 1% for transportation cost is included.

3) Cost for repair 53,764 thons. Yen

For other equipment than the above 2), 5% of equipment's price is estimated.

VI. Implementation Plan

(1) Implementation System

Japanese consultant and Japanese trading company (supplier) shall execute this procurement project in cooperation with JICA, Japanese Ministry of Foreign Affairs and Embassy of Japan in India.

Japanese consultant shall perform the services for the preparation of the tender, opening and evaluation of the tender, assistance in contract negotiations, cordination of the contract verification by JICA and Japanese Ministry of Foreign Affairs and the attendance of the on-the-job training in accordance with the contract with Indian side.

The supplier shall execute the procurement, transportation, installation and on-the-job training of the medical equipments and cordination of after care services of manufactures, in accordance with the supply contract.

Table 20 : REQUEST PROCEDURE

S G P G I

↓ Apprication Form for Medical Equipments Import

Ministry of Industry (Director General for Technical Development)

↓ Certificate on Non-Manufactured in India

Ministry of Health

↓ Certificate on the Customs Duty Exemption

Clearing Agent

(2) Implementation Body

The implementation body of the project is SGPGI. Regarding customs clearance and tax-exemption, it is necessary for SGPGI to obtain OGL (Open General Licence: Tax-free treatment), OGL is applicable to equipments for colleges, other educational facilities, laboratories in hospitals, institutes of sciences and actually in case of King George Medical College, it was issued without problems. Therfore, it is supposed to be obtained without problems also in case of SGPGI.

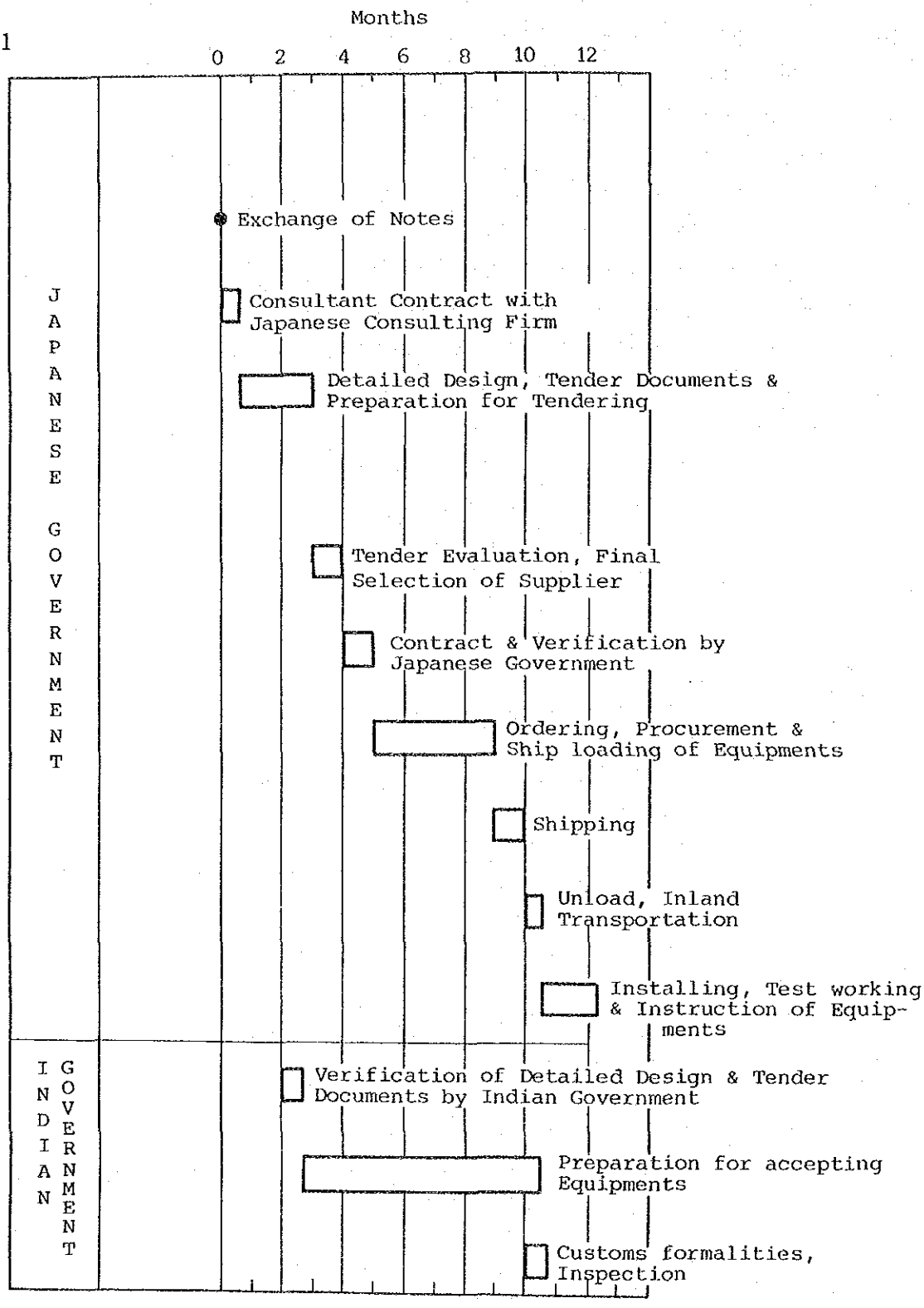
(3) Procurement Plan of Equipment

The equipments listed in IV. Basic Design are mainly of Japanese origin and for some items, of foreign origin which are available in Japan. The above equipments shall be transported by sea being containerized in princeple and regarding reagents of short term of validity, they shall be transported by air in manufacture's own expense. After unloading at Bombay, the equipments is carried to the site by truck. It takes 30 days for marine transport from Yokohama to Bombay and, 7 day for inland transportation.

(4) Implementation Plan

When the project will be implemented following the procedure of Grand Aid System of Japanese Government, about twelve months are considered to be needed from Exchange of Notes.

Table 21



VII. Evaluation of Project

Analysis of health and medical care environment of India reveals imbalance between supply and demand of medical services. In other words, medical services are absolutely insufficient for the size of the population and number of patients, especially those who suffer from infectious diseases, heart diseases and other diseases caused by malnutrition. Insufficiency is most serious in number of physicians, nurses and other paramedical staff in addition to scarce medical facilities and beds. To cope with this problem it is vital and most effective to expand facility for medical education and training to foster good human resources.

Under such circumstances the Government of India decided to establish a hospital for post post graduate training to enhance the level of human resources in medicine and the quality of medical services. The decision for improved health care policies is clearly stated in the Government's 5 year national development plan announced in 1983. The construction of Sanjay Gandhi Post Graduate Institute of Medical Sciences, which is a national project originated in the above-mentioned policy of the Government is taking place in Lucknow, the capital of Uttar Pradesh State (population: 120 million), the largest state of India. The institute is planned to be made a comprehensive training center to accept post graduates mainly from Uttar Pradesh State, and other schools in various parts of India. The institute will provide a wide range of training not only for physicians but also for paramedical staff including nurses, pharmacists, laboratory technologists and X-ray technologists. At the same time the institute will be equipped with super speciality of the following six to carry out advanced researches of medical sciences.

1. Neurology and Neuro-Surgery
2. Cardiology and Cardiovascular Surgery
3. Gastroenterology-Medical & Surgical
4. Urology and Nephrology-Medical & Surgical
5. Endocrinology
6. Genetics and Immunology

In supporting the above-mentioned functions, the institute will have a hospital of 300 beds for the time being, which will be expanded to 600 by the end of 1987 and eventually to 1800. Clinical operation will be in principle limited to the range of above-mentioned 6 departments in phase I and Pathology Department (including biochemistry and microbiology), X-ray Department, Operation Department and etc. to support the 6 speciality departments.

The institute will be run by the state government and financially supportted by it. The cost of construction is fully borne by India, and many of the planned facilities and already in construction. Medical equipments are also planned to be procured domestically with regard to the things manufactured in India. The operation of the health center (30 beds) to be shortly opened is scheduled to be started without any problem. However, for the full operation of the institute, which is a highly advanced one, it is necessary to heavily depend on import in procuring advanced equipments. In this area the Government of India has requested the Governmen of Japan to extend gratuitons grant for import and procurement of necessary equipments.

As stated in following chapters in this report, the study team closely studied the Project through discussion with India and observations from the aspects of the outline of the plan and its problems, plan for medical education and training, plan for medical science researches, plan for hospital functions and administration, plan for procurement of medical equipments, plan for maintenance and finance, plan for construction and possible ways for Japan to extend economic cooperation. Further, the study team discussed among ourselves the feasibility of the project and had impression of the following 4 points.

1) SGPGI is a major project of the sixth & seventh 5-year plan aimed at drastically improving health and medical care of India and is of great interest of all people concerned and headed by Prime Minister Rajiv Gandhi.

2) It has been judged that the list of equipment Japan was requested to provide is adequate by and large in comparison with functions and the scale of SGPGI.

3) Construction of various facilities at the site has progressed in a steady manner in conformance with detailed schedules.

4) Responsible officials at the working level of the central and local governments have committed themselves to be responsive and to take measures necessary for inplementation of the planned aid.

After confirming in India the content of the request made by the Government of India, the study team prepared a plan to grant equipments for 6 super speciality departments of Neurology and Neuro-Surgery, Cardiology and Cardiovascular Surgery, Gastroenterology, Urology and Nephrology, Endocrinology and Genetics and Immunology as well as central departments of Pathology, Radiology, Operation, I.C.U., Ward, Physical and service departments of Central Supply, Autopsy, Animal House, Kitchen, Laundry, Medical Gas, Workshop, Administration, etc.. The plan also includes instruments necessary for maintenance, training and laboratory works.

These equipments are considered as of absolute necessary for the time being for the accomplishment of the national project of India. This list will make possible provision of advanced tertiary medical services not only in Uttar Pradesh State but also on the nation wide basis. In addition, the quality of the institute will be improved comprehensively reiniorcing the local medical systems. With regard to education and training, the institute will provide post post graduate education to supply highly trained human resources for medical services enhancing overall quality of local medicine. Also by applying results of advanced researches and studies to clinical medicine in the future, provision of further advanced medicine will be made possible contributing to improvement of the level of medicine of the nation as a whole.

In the light or the organization and personal system (plans for allocation of employees and technical levels of people), it is judged that there is adequate basis to accomodate the equipments planned to be provided. Facilities are also good enough to accept them.

In addition, installation related works and maintenance do not seem to give substantial burden to India, and actually they have already allocated some budget. Therefore, it is inconceivable any problem will arise in this aspect.

VIII. Conclusion and Recommendation

As stated before, that provision of medical equipment to SGPGI can expand its role and function, strengthen health and medical care system of not only Uttar Pradesh, but also of all India and can train physicians and related medical personnel successively.
The above fact will improve development of health and medical conditions because it will support medical care system on the national level.
Therefore, the study team believes that the project is very important for improvement of national health and medical care conditions and it is appropriate for an object of grant aid by the Government of Japan.

However, since the facilities of SGPGI are under the construction now, when a large amount of advanced equipment from Japan would introduce at once, there are some possibilities to meet with difficulty to operate them.

For the first year (1986), the team recommends to introduce the equipments for hospital function expecting improvement of experiences for operation and for the second year (1987) the team advices to introduce the advanced equipments, which are useful for improvement of research function and hospital function.

For installation of the above equipments the Governt of India is required to provide minimum expenses for reagents and consumables, running costs for electricity and water, as well as for maintenance and repairing.

The team would like to propose the Government of India for optimum utilisation of equipments, to change the layout and to implement piping construction so that operation of equipment will be carried under good conditions.

ANNEX

(1) Members List (Phase I)

Dr. Masumi Oike	Team Leader (Hospital planning) Director General, National Institute of Hospital Administration, Ministry of Health and Welfare
Dr. Nobuo Kato	Vice Team Leader (Medical research) Professor, Nagoya University School of Medicine
Dr. Sadayuki Sakuma	Dean, (Medical education) Nagoya University School of medicine
Dr. Yoshi Hirose	Director, (Medical equipment planning) Office of Medical Technology Development, Health Policy Bureau, Ministry of Health and Welfare
Dr. Kiyoshi Suwa	Assistant Director, (Grant aid policy) Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. Seiichi Kanai	Deputy head, (Project cordination) First Basic Design Study Division, Grant Aid Planning and Survey Department, Japan International Cooperation Agency
Dr. Rintaro Okamoto	Technical Advisor, Institute of Hospital System Development

Mr. Yoshihisa Watanabe	Director, Institute of Hospital System Development
Mr. Hajime Ikeda	Architect, Daiichi Health Care Facility Consultants Inc.

Members List (Phase II)

Dr. Yoshi Hirose	Director, (Leader) Office of Medical Technology Development General Affairs Division, Ministry of Health & Welfare
Dr. Takeo Ishigaki	Assistant Professor, (Medical research) Faculty Medicine, University of Nagoya
Mr. Seiichi kanai	Deputy head, (Project coordination) First Basic Design Study Division
Dr. Rintaro Okamoto	Technical Advisor, (Hospital system) Institute of Hospital System Development
Mr. Yoshihisa Watanabe	Director, (Medical equipment) Institute of Hospital System Development
Mr. Norito Naitoh	Director, (Medical equipment) Daiichi health care facility consultants Inc.
Mr. Minoru Yamada	Mechanical engineer, (Facility) P.T. Morimura & Associates

Members list (Phase III)

Dr. Yoshi Hirose	Director, (Leader) Office of Medical Technology Development General Affairs Division, Ministry of Health & Welfare
Mr. Seiichi Kanai	Deputy Head, (Project Coordination) First Basic Design Study Division
Mr. Shigeru Chatani	Technical Cooperation Division Ministry of Forgin Affairs
Mr. Shiro Kajiwara	Technical Advisor, (Hospital System) Institute of Hospital System Development
Mr. Yoshihisa Watanabe	Derector, (Medical Equipment) Institute of Hospital System Development

(2) Schedule of Study (Phase I)

Feb. 3 (Mon.)	Morn.	The team leader, Dr. OIKE and 8 members arrived in Delhi.
	aftern.	Courtesy visit to Japanese Embassy. (Courtesy call, Receiving of information about general and medical situation of India, as well as SGPGI.)
Feb. 4 (Tue.)	Morn.	Discussion with Ministry of Finance. (Courtesy call, Briefing about implementation system of SGPGI.)
	aftern.	Discuss. with Ministry of Health. (Courtesy call, Collecting of information about Health and Medical Situation about implementation system of SGPGI.) Courtesy visit to Secretary of the Ministry.
Feb. 5 (Wed.)	morn.& aftern.	Visit to National Institute of Health & Family Welfare and ICMR. (Courtesy call, Collecting of Information about Health and Medical Situation in India.)
	aftern.	Arrive. Lucknow, Uttar Pradesh.
Feb. 6 (Thur.)	morn.& aftern.	Observation and discuss with SGPGI. (Study about background of planning, concept of program procedure of facilities and construction.)
	aftern.	Courtesy call on Secretary, State Ministry of Health.
Feb. 7 (Fri.)	morn.	Discuss. with each departments of SGPGI. (Medical equipments, building and technical cooperation.)
	after.	Courtesy visit to Minister of Health, State and Governor.
Feb. 8 (Sat.)	morn.	Courtesy visit to KGMC. (Study on its activities, Discuss. about present medical situation of Japan and India.)
	after.	Discuss. with SGPGI. (Schedule of the procurement project and related problems.)

Feb.10 (Mon.)	morn.	Final discuss. with SGPGI. (Schedule of the procurement project and related problems.)
Feb.11 (Tue.)	morn.	Visit to Safdarjung Hospital and AIIMS. (Study on medical situation of India.)
	aftern.	Discuss. on the minutes with Indian Government Officials.
Feb.12 (Wed.)	morn.	Arrive. Agra. Visit to JALMA Institute. (Study on medical situation of India.)
	aftern.	Arrive in Delhi.
Feb.13 (Thus.)	aftern.	Visit to ministry of Finance. (Signing of minutes.) Report to Japanese Embassy.
Feb.14 (Fri.)	morn.	Leave Delhi.

Schedule of Study (Phase II)

March 31 (mon.)	morn.	Member of OKAMOTO, WATANABE, NAITO and YAMADA. Arrived in Delhi.
	aftern.	Courtesy visit to Ministry of Finance. Courtesy visit to Japanese Embassy.
April 1(Tue.)	aftern.	Courtesy visit to Ministry of Health & Family Welfare.
April 2(Wed.)	aftern.	Arrive. Lucknow.
April 3(Thur.)	morn.	Discuss. in SGPGI.(All members.)
	aftern.	Studied by 3 groups. (Survey on medical equipments, facilities and health & medical environment.) WATANABE surveyed on agent's situation.
April 4(Fri.)	morn.& aftern.	Studied by 3 groups. (Ditto)
	aftern.	WATANABE surveyed on agent's situation.
April 5(Sat.)	morn.& aftern.	Studied by 3 groups.(Ditto)
	aftern.	WATANABE surveyed on agent's situation.
April 7(Mon.)	morn.& aftern.	Studied by 3 groups. (Ditto)
April 8(Tue.)	morn.& aftern.	Studied by 3 groups. (Ditto)
April 9(Wed.)	morn.& aftern.	Studied by 3 groups. (Ditto)
April 10(Thur.)	morn.& aftern.	Studied by 3 groups. (Ditto)
	morn.	HIROSE, ISHIGAKI and KANAI arrived Delhi.
	aftern.	HIROSE, ISHIGAKI and KANAI courtesy visit to Japanese Embassy.

April 11(Fri.)	morn.& aftern.	Studied by 3 groups. (Ditto)
	aftern.	WATANABE surveyed on agent's situation. ISHIGAKI discussed on Radiology departments.
April 13(Sun.)	aftern.	Meeting of the Study team. (Policy of discussion, Contents of minutes.)
April 14(Mon.)	morn.	Discuss. in SGPGI.
	aftern.	Discuss. on minutes. NAITO and YAMADA studied on K.G. medical College. WATANABE, NAITO and YAMADA. Arrive. Delhi.
April 15(Tue.)	morn.&	Discuss. on minutes. (Lucknow.)
	aftern.	ISHIGAKI studied on K.G. medical college. WATANABE surveyed on agent's situation.(New Delhi)
	aftern.	HIROSE, ISHIGAKI, KANAI and OKAMOTO arrived New Delhi.
April 16(Wed.)	morn.	Discuss. on minutes. WATANABE surveyed on agent's situation. ISHIGAKI, NAITO and YAMADA studied on AIIMS.
	aftern.	Signing of minutes. Report to Japanese Embassy.
April 17(Thur.)	morn.& aftern.	Consult. with Japanese Embassy.
April 18(Fri.)	morn.	Leave Delhi.

Schedule of Study (Phase III)

August 6 (Wed.)	morn.	Leader Hirose, member of Kajiwara and Watanabe arrived in Delhi.
	aftern.	Courtesy visit to Japanese Embassy. Member of Chatani arrived in Delhi.
August 7 (Thur.)	morn.	Courtesy vist to ministry of Finance
	aftern.	Arrived Lucknow. Member of Kanai arrived in Delhi.
August 8 (Fri.)	morn.	Kanai visit to discuss to Japanese Embassy
	morn. & aftern.	Discuss in SGPGI (all members without Kanai)
	aftern.	Kanai arrive Lucknow.
August 9 (Sat.)	morn. & aftern.	Discuss in SGPGI (facilities, medical equipment, technical cooperation)
August 10 (San.)	morn. & aftern.	Discuss in SGPGI (medical equipment)
August 11 (Mon.)	morn. & aftern.	Discuss in SGPGI (medical equipment, technical cooperation)
August 12 (Tue.)	morn.	Discuss in SGPGI (medical equipment, Minutes)
	aftern.	Arrived Delhi.
August 13 (Wed.)	morn.	Discuss in Japanese Embassy
	aftern.	Discuss on minutes.
August 14 (Thur.)	morn.	Signing of minutes.
	aftern.	Report to Japanese Embassy
August 15 (Fri.)	morn.	Leave Delhi

(3) Persons Interviewed (Phase I)

Government of India, Ministry of Finance

1. Mr. Deepak Chatterjee
   Joint Secretary, Govt. of India Ministry of Finance

2. Mr. V. Subramaniann
   Director, Govt. of India Ministry of Finance

3. Mr. D.P. Srivastava
   Under Secretary, Govt. of India Ministry of Finance

Ministry of Health & Family Welfare, Indian Government

1. Mr. S.S. Dhanoa
   Secretary, Govt. of India Ministry Health & Family Welfare

2. Mr. P.K. Umashankar
   Additional Secretary, Govt. of India Ministry Health & Family Welfare

3. Dr. (Mrs) Lata Singh
   Joint Secretary, Govt. of India Ministry Health & Family Welfare

4. Mr. N.S. Bakshi
   Director, Govt. of India Ministry Health & Family Welfare

5. Dr. Sneh Bhargava
   Director (AIIMS)

6. Dr. Harcharan Singh
   Joint Adviser, Planning Commission, New Delhi

7. Dr. K.B. Sharma
   Director General of Health Services, Govt. of India

8. shing. K. Majumdar
   Dir Hospital Services
   Consaltancy Corporation

9. Mr. G.G.K. Nair
   Under secretary, Govt. of Ministry Health & Family Welfare

10. Dr. S. Lal
    Regional Director, Govt. of Ministry Health & Family Welfare

Hospital Services Consultancy Corporation, Ltd.

1. Mr. G. K. Majumdar
   Director of Hosptal services consaltancy corporation

State Government

1. Mr. Veer Bhadur Singh
   Chief Minister, Uttar Pradesh, Lucknow.

2. Mr. J.A. Kalyankrishnan, I.A.S.
   Chief Secretary, U.P. Govt., & Presedint of S.G.P.G.I of
   Medical Sciences.

3. Mr. Lokpati Tripathi
   Health Minister, U.P. Lucknow

4. Mr. Shyam Suri
   I.A.S. Health Secretary, U.P. Lucknow

5. Mr. D. Diptivilasa
   I.A.S. Joint Health Secretary, U.P. Lucknow

Sanjay Gandhi Post Graduate Institute of Medical Sciences

1) Institute Authorities

1. Dr. B.C. Joshi
   Director S.G.P.G.I.

2. Dr. S.S. Agarwal
   Professor in Genetics, S.G.P.G.I.

3. Dr. (Mrs.) Ratni B.Gujral
   Associate Professor in Radio-diagnosis, S.G.P.G.I.

4. Dr. M.S. Valiathan
   Director Sree Chitra Institute of Medical Sciences &
   Technology, Trivandrum.

5. Dr. B.B. Sethi
   Principal K.G. Medical College.

2) Consultants & Advisors

1. Prof. T.R. Anand
   National Institute of Health & Family
   Welfare, New Delhi.

2. Prof. A.K. Banerjee
   All India Institute of Medical Sciences,
   New delhi

3. Dr. D.K. Chabra
   Dept. of Neuro-surgery K.G. Medical
   College, Lucknow.

4. Dr. M.S. Valliathan
   Sree Chitra Institute of Medical Sciences & Technology,
   Trivandrum

5. Prof. K.N. Sinha
   Dept. of Surgery, K.G. Medical College

6. Prof. K.K. Malhotra
   Dept. of Medicine,
   All India Institute of Medical Sciences

7. Prof. R.V.S. Yadav
   Dept. of Surgery (Kidney Transplantation), P.G.I of
   Medical Education & Research, Chandegarh

8. Dr. M.K. Mitra
   Dept. of Medicine, K.G. Medical College

9. Dr. K.M. Singh
   Dept. of Surgery, K.G. Medical college

10. Dr. D.K. Bhargava
    Dept. of Medicine,
    All India Institute of Medical sciences

11. Dr. C.G. Agarwal
    Dept. of Medicine, K.G. Medical College

12. Prof. (Mrs.) Sneh Bhargava
    All India Institute of Medical Sciences

13. Prof. A.N. Malaviya
    Dept. of Medicine,
    All India Institute of Medical sciences

14. Dr. U.C. Chaturvedi
    Dept. of Pathology & Bacteriology, K.G. Medical College

15. Dr. Mam Chandra
    Gastroenterologist, Department of Medicine
    K.G. Medical College

3) Architects & Builders

1. Sri D.C. Nautiyal
   General Manager,
   U.P. Rajkiya Nirman Nigam, Ltd.

2. Sri D.S. Bhui
   Senior Architect,
   U.P. Rajkiya Nirman Nigam, Ltd.

3. Prof. Vijay Agarwal
   Design Architect,
   U.P. Rajkiya Nirman Nigam, Ltd.

4. Er. S. Kumar
   U.P. Rajkiya Nirman Nigam, Ltd.

Natinal Institute of Health & Family Welfare

1. Prof. T.R. Anand
   Dean, National Institute of Health & Family Welfare

2. Prof. D.H. Nath
   Education & Training N.I.H.F.W., New Delhi.

3. Dr. Anil Jindal
   Population Genetics and Human Development

4. Mr. Mrinal K. Ray
   National Documentation Centre, N.I.H.F.W

5. Assistant Prof. Indira Musali
   Community Health Administration

6. Assistant Prof. Monica Sharma
   Community Health Administration

7. Assistant Prof. Y.P. Gupta
   Planning and Evaluation Department

8. Assistant Prof. P.S. Bhatia
   Statstics and Demography

Indian Council of Medical Research

1. Dr. Chelliah

2. Dr. Tripathy

K.G. Medical College

1. Dr. B.B. Sethi
   Principal, K.G. Medical College

2. Dr. D.K. Chabra
   Dept. of Neuro-surgery, K.G. Medical College

3. Prof. K.N. Sinha
   Dept. of Surgery, K.G. Medical College

4. Dr. M.K. Mitra
   Dept. of Medicine, K.G. Medical College

5. Dr. C.G. Agarwal
   Dept. of Medicine, K.G. Medical College

6. Dr. K.M. Singh
   Dept. of Surgery, K.G. Medical College

7. Dr. U.C. Chaturvedi
   Dept. of Pathology & Bacteriology, K.G. Medical college

8. Other proffessors of each department

All India Institute Medical sciences

1. Prof. (Mrs.) Sneh Bhargava
   Director and Prof. of Radio-Diagnosis

2. Mr. M.C. Maheshwari
   Deputy Director (ADMN)

3. Dr. J.S. Guleria
   Dean & Prof. of Medicine

4. Dr. A.N. Safaya
   Medical Superintendent

5. Dr. M.L. Bhatia
   Prof. of Cardiology

6. Dr. M.C. Maheshwari
   Prof. of Neurology

7. Mr. B.K. Dash
   Public Relations Officer

Central JALMA Institute for Leprosy

1. Dr. Ved Bharadwaj
   Deputy Director, JALMA

2. Dr. G. Ramu
   Deputy Director, JALMA

3. Dr. J. Sin Gupta
   Assistant Director, JALMA

Persons Interviewed (Phase II)

Government of India, Ministry of Finance

1. Mr. Deepak Chatterjee
   Joint Secretary, Govt. of India Ministry of Finance

2. Mr. V. Subramaniann
   Director, Govt. of India Ministry of Finance

3. Mr. D.P. Srivastava
   Under Secretary, Govt. of India Ministry of Finance

Govt. of India, Ministry of Health & Family Welfare

1. Dr. (Mrs) Lata Singh
   Joint Secretary, Govt. of India Ministry Health & Family Welfare

State Government

1. Mr. Shyam Suri
   I.A.S. Health Secretary, U.P. Lucknow

2. Mr. D. Diptivilasa
   I.A.S. Joint Health Secretary, U.P. Lucknow

Sanjay Gandhi Post Graduate Institute of Medical Sciences

1) Institute Authorities

1. Dr. B.C. Joshi
   Director S.G.P.G.I.

2. Dr. S.S. Agarwal
   Professor in Genetics, S.G.P.G.I.

3. Dr. (Mrs.) Ratni B.Gujral
   Associate Professor in Radio-diagnosis, S.G.P.G.I.

2) Consultants & Advisors

1. Dr. B.B. Sethi
   Prencipal K.G. Medical College.

2. Dr. D.K. Chabra
   Dept. of Neuro-surgery K.G. Medical
   College, Lucknow.

3. Prof. K.N. Sinha
   Dept. of Surgery, K.G. Medical College

4. Dr. M.K. Mitra
   Dept. of Medicine, K.G. Medical College

5. Dr. K.M. Singh
   Dept. of Surgery, K.G. Medical college

6. Dr. C.G. Agarwal
   Dept. of Medicine, K.G. Medical College

7. Dr. U.C. Chaturvedi
   Dept. of Pathology & Bacteriology, K.G. Medical College

8. Dr. Mam Chandra
   Gastroenterologist, K.G. Medical College

9. Dr. Devika Nag
   Professor & Head of Dept. Neurology, K.G. Medical College

10. Dr. Mahesh Chandra
    Reader of Medicine, Cardiology, K.G. Medical College

11. Dr. Dinkar Chandra
    Professor of Pathology, K.G. Medical College

12. Mr. H.O. Migra
    Scientist, Industrial Technology Research Center, Lucknow

13. Mr. Sharad Srivastava
    General Manager (Computer), Uptron India Ltd.

3) Architects & Builders

1. Sri D.C. Nautiyal
   General Manager,
   U.P. Rajkiya Nirman Nigam, Ltd.

2. Sri D.S. Bhui
   Senior Architect,
   U.P. Rajkiya Nirman Nigam, Ltd.

3. Prof. Vijay Agarwal
   Design Architect,
   U.P. Rajkiya Nirman Nigam, Ltd.

4. Er. S. Kumar
   U.P. Rajkiya Nirman Nigam, Ltd.

5. Mr. R.K. Saxena
   Admin. Officer, UPRNN

6. Dr. H.S. Srivastava
   UPRNN

7. Mr. D.B. Sanyal
   Artist, UPRNN

8. Mr. C.P. Singh
   Project Manager, UPRNN

9. Mr. Samir Chaturvedi
   Architect, UPRNN

10. Mr. Prabhat Kumar
    Project Manager, Unit IV, UPRNN

11. Mr. Hirak Bhattacharya
    Plumbing Engineer, UPRNN

Agent of Medical Equipment

1. Mr. R.N. Seth
   Executive Vice President, Blue Star Ltd

2. Mr. V.K. Wangnoo
   Manager, Analytical Instruments Dept., Blue Star Ltd

3. Mr. Mohan Miglani
   Manager, Medical Electronics Dept., Blue star Ltd

4. Mr. Anupam Sharma
   Sales Engineer, Medical Electronics Dept,. Blue Star Ltd.

5. Mr. T.R. Subramanian
   Senior Engineer, Medical Electronics Dept., Blue Star Ltd.

6. Mr. Raj Kumar Gupta
   Chairman, the United Group

7. Mr. A. Philips
   Private Secretary to Chairman, the United Group

8. Mr. Satish Kumar
   Vice President & Director, the United Group

9. Mr. R.K. Amba
   Regional Marketing Manager, Uniscans & Sonics Ltd
   (United Group)

10. Mr. B.P. Toshniwal
    Chairman & Managing Director, Toshniwal Bros. Pvt. Ltd

11. Mr. Alok Toshniwal
    Joint Managing Director, Toshniwal Bros. Pvt. Ltd

12. Mr. Sunil Toshniwal
    Joint Managing Director, Toshniwal Bros. Pvt. Ltd

13. Dr. Kanwar Bahadur, PhD
    Technical Adviser & Service Manager, Toshniwal Bros. Pvt. Ltd

14. Mr. T.S. Rajagopal
    Product Manager, Toshniwal Bros. Pvt. Ltd

15. Mr. A.P. Singh
    Sales Manager, Toshniwal Bros. Pvt. Ltd

16. Mr. Devdutt Bhatia
    Product Executive, Toshniwal Bros. Pvt. Ltd

17. Mr. Gopal Krishna
    Chief Executive, Shibumi Medical Systems

Persons Interviewed (Phase III)

State Government

1. Mr. Shyam Suri
   I.A.S. Health Secretary, U.P. Lucknow

2. Mr. D. Diptivilasa
   I.A.S. Joint Health Secretary, U.P. Lucknow

Sanjay Gandhi Post Graduate Institute of Medical Sciences

1. Mr. Lakshmi Narain
   Finaceal Officer of SGPGI

2. Dr. K.N. Sinha
   SGPGI

3. Dr. R.C. Ahuja
   SGPGI

4. Dr. R.K. Saran
   SGPGI

5. Dr. D.K. Chhabra
   SGPGI

6. Dr. U.C. Chaturvedi
   SGPGI

7. Dr. D. Nag
   SGPGI

8. Dr. S.S. Agarwal
   SGPGI

9. Dr. I.G. Lakshmipati
   SGPGI

10. Dr. B. Gujiral
    SGPGI

11. Mr. C.G. Agalwal
    SGPGI

12. Mr. S.P. Goel
    SGPGI

13. Dr. Chandra
    SGPGI

14. Dr. Mishra
    SGPGI

Architects & Builders

1. Dr. D.S. Bhui
   U.P. Rajkiya Nirman Nigam, Ltd.

2. Er. D.C. Nautial
   U.P. Rajkiya Nirman Nigam, Ltd.

(4) Minutes of Discussions

Agreed Minutes of Discussions

On

Sanjay Gandhi Post Graduate Institute of Medical Sciences Project

In response to the request from the Government of India, the Government of Japan decided to conduct a basic design study on Sanjay Gandhi Post Graduate Institute of Medical Sciences (S.G.P.G.I.) Project and entrusted the study to the Japan International Cooperation Agency (JICA). For this purpose, JICA sent to India, a Nine Member Study Team headed by Dr. Masumi Oike, Director General, National Institute of Hospital Administration, Ministry of Health and Welfare from 3rd to 13th February, 1986.

The Study Team had a series of discussions on the Project with the officials concerned of the Government of India and the State Government of Uttar Pradesh and conducted a field survey of the Project site in Lucknow, Uttar Pradesh.

As a result of this study, both parties agreed that the major points of understanding which are attached herewith, need to be considered towards the realization of the Project.

February 13, 1986.

Masumi Oike
(Dr. Masumi Oike)
Leader of the Team

(D. Chatterjee)
Joint Secretary
Ministry of Finance
Department of Economic Affairs

(Dr. Lata Singh)
Joint Secretary
Ministry of Health & Family Welfare

Annexure I

The Major Points of understanding

1. The Study Team explained in detail to the Indian side about the structure and system of the Japanese Grant Aid for which the Indian side showed a deep understanding.

2. The Study Team was apprised of the financial requirements regarding the supply of medical and other equipment for S.G.P.G.I. Project through a Japanese Grant Aid (List of the said medical and other equipment attached as Annexure II).

3. The Study Team confirmed that the executing body of S.G.P.G.I. Project is the Department of Health in the State Government of Uttar Pradesh and for implementation of the Project, the Government of India agrees to take necessary measures without delay to arrange customs clearance of the equipment and their despatch to the project site.

4. The Study Team confirmed that the construction work at S.G.P.G.I./site is progressing smoothly according to the orignial construction schedule, and that in view of this progress, there will be no problem at the time of importation and installation of medical and other equipment needed for S.G.P.G.I.

5. The Study Team made a note of the request from the Indian side for Technical Assistance as an integral part of the import requirement of the Project. This includes deployment of Japanese experts at S.G.P.G.I. to the extent possible, training of Indian technicians, engineers, medical specialists in relevant organisations in Japan, and setting

..2/-

up a workshop at S.G.P.G.I. for maintenance of imported equipment.

6. The Study Team made a note of the request from the Indian Side that in procurement, due regard would be paid to the capability of a supplier to provide servicing facilities, spares and consumables over a sufficiently long time in India.

7. The Study Team made a note of the request from the Indian side to the effect that the Japanese suppliers could procure and supply equipment from other countries, if equipment of required technical specifications is not available in Japan.

Annexure II

The tentative list of equipment requested for the S.G.P.G.I. Project by the Government of India, referred to in clause 2, Annexure I, is enclosed.

(Phase – II)

AGREED MINUTES OF DISCUSSIONS
ON
SANJAY GANDHI POST GRADUATE INSTITUTE OF MEDICAL SCIENCES PROJECT.

In response to the request from the Government of India, the Government of Japan had sent a basic design Study Team from Japan International Co-operation Agency (JICA) on Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI) Project in February, 1986. On the basis of a positive report of this Team about the needs of the SGPGI in requirement of medical and allied equipments, the Japanese Government agreed to send a follow-up Study Team in two phases. A four-member Consulting Team visited India from April 1 to 17, 1986 and a three member official mission headed by Dr. Yoshi Hirose, Director, Office of Medical Technology Development, Ministry of Health & Welfare joined them from April 10, 1986.

The Study Team had a series of discussions on the Project with the officials concerned of the Govt. of India, the State Govt. of Uttar Pradesh and the SGPGI and conducted a detailed study on the requirements of equipments in the SGPGI, the existing facilities in the Institute for installation and use of the equipments and other allied subjects.

As a result of this Study, both parties agreed that the major points of understanding which are attached herewith, need to be considered towards the realisation of the Project.

April 16, 1986.

(Dr. Yoshi Hirose)
Leader of Japanese Team

(D. Chatterjee)
Joint Secretary
Ministry of Finance
Department of Economic Affairs

(Dr. Lata Singh)
Joint Secretary
Ministry of Health & Family Welfare

ANNEXURE-I

1. The Study Team drew up a list of equipment through discussions with Indian counterparts as attached, which is categorised as A and B.

Technically both A and B are essential for the S.G.P.G.I. Project. A will be required immediately and B will be required in the near future.

2. The Team requested that Indian side will get the list of equipment cleared for imports through the appropriate authorities of the Central Government before the visit by the next team.

3. The team suggested the following things :-

(a) A more accurate idea about the maintenance and running costs will be provided at the next visit to help in budgeting from Indian side.

(b) Infrastructure facilities (medical gas, water, electricity etc.) should be established upto the site of installation before the arrival of the equipments.

(c) Procurement of radio-isotopes will be managed by the Indian side. The Indian side assured that this will be done.

(d) Mobilisation of all medical and technical staff should be completed in time and the Japanese side may be kept informed about the progress.

4. The Team pointed out that the internal designing of ICU, operation theatre and radiology sections would need slight modifications, for which the Japanese side will provide the necessary suggestions at the next visit in July.

5. The Indian side reiterated their request for long term technical co-operation for the Institute and noted that this will be appraised by a separate Mission to be sent by the Japanese Government shortly.

6. The Indian side requested that training of doctors, engineers and technicians will be necessary before installation for maintenance and running of equipment as part of supply arrangements.

LIST OF EQUIPMENT

DEPARTMENT	A	B
1. Neurology	1. EEG System	(i) Evoked Response Audiometry
	2. EMG	(ii) Perimeter
	3. Fundus Camera	(iii) Others 16
	4. Ultra Sonography	
	5. Eyeshaking Test	
	6. Codatomy Unit	
	7. Telemetry Pressure	
	8. Others 20	
2. Cardiology	1. ECG	(i) Others 4
	2. Holter Monitoring System	
	3. Echo-Cardiograph	
	4. Pace Maker Analyzer	
	5. Others 7	
3. Gastro-entrology	1. Upper Gastro-Endoscope	(i) Endoscopic Ultrasound
	2. Duodeno-Endoscope	(ii) Others 5
	3. Colonoscope	
	4. Vidêo Endoscope	
	5. Others 8	
4. Urology	1. Hemodialysis system	(i) * Electron Microscope
	2. * Kidney stone Disintegration	(ii) Ultrasonic Distuption
	3. Others 20	(iii) Others 13

	A	B
5. Endocrinology	1. Gamma Counter 2. Scintilation Counter 3. Liquid Chromatography 4. Column Chromatography 5. Elisa Equipment 6. Others 40	1. Others 25
6. Genetics-Immunology	1. Liquid Scintilation Counter 2. Gamma Counter 3. Multi Gamma Counter 4. Phagocytosis Measurement 5. FPLC 6. HPLC 7. Image Analysis System 8. Hematology Counter - ELISA Apparatus - Cyto Fluorometer - Cell Sorter 9. Liquid Nitrogen Handling System 10. Others 115	1. Column Chromatography 2. Aerofuge 3. Inverted Microscope(Special) 4. Loop Cinerator 5. Emission Spectrometer 6. Others 30

	A	B
7. Central Department (1) Pathology	1. Automated Differential Analyzer 2. 20ch Automated Analyzer 3. Single/Multi Auto Analyzer 4. Blood Gas Analyzer 5. Electrolyte Analyzer 6. Spectrometer 7. Blood Cell Analyzer 8. Electron Microscope 9. Others 62	1. ELISA Apparatus 2. Liquid Chromatograph 3. Gas Chromatograph 4. Others 32
(2) Radiology	1. Whole Body CT 2. Cardio Angiography (DSA) 3. Cerebral Angiography (DSA) 4. Abdominal Angiography 5. Computer Radiography 6. Buckey Radiography 7. X-ray TV (Gastra) 8. X-ray TV (Myelography) 9. X-ray TV General 10. Skull Radiography 11. Ultrasound 12. Linear Accelator 13. After Loading 14. Simulator 15. Gamma Camera 16. Gamma Counter 17. Others 19	1. Head CT 2. Cobalt Therapy 3. Planning System 4. Multi Detector 5. Beta Counter 6. NMR CT 7. PET 8. Thyroid Uptake 9. T 99 Generator 10. Others 5

	A	B
3. OPERATION	(1) Operation Light	(i) Others 15
	(2) Operating Table	
	(3) $Anesthesia Machine	
	(4) Electro-Surgical Unit	
	(5) Operating Microcope	
	(6) Radiggraphy Equipment	
	(7) °Clean Room Equipment	
	(8) LASER Surgical Unit	
	(9) Ultrasonic Surgical Unit	
	(10) Others 35	
4. I C U	(1) °Monitor	(i) Ion Analyser (Ca,MG)
	(2) °Central Monitoring System	(ii) Coagulation Profiler
	(3) Ventillator	(iii) Others 15
	(4) Polygraph	(iv) °Single/Multi Automated Analyser
	(5) Portable Defibrillator	
	(6) ICU Bed	
	(7) Blood Gas Analyser	
	(8) Electrolyte Analyser	
	(9) Hematology Analyser	
	(10) Automatic Blood Presmure Monitor	
	(11) Others 22	

DEPARTMENT	A	B
5. Ward	(1) Ward Equipment	
6. Physical Medicine	(1) Others 2	
7. Central Supply	(1) Autoclave (2) Ultrasonic Washer (3) ECG Sterilizer (4) Others	
8. Autopsy	(1) Others	
9. Animal House		(1) Cages, Rearing Unit (ii) Animal House (~~iii~~) Facility Equipment (~~iv~~) Radiography (v) Scintilation Counter (~~vi~~) Respirator (~~vii~~) Angiography (~~viii~~)Others 33
10. Kitchen	(1) Others	
11. Laundry	(1) Others	
12. Medical Gas	(1) Liquid Nitrogen Plant	(1) Liquid Helium Recovery System (ii) Others

	Department	A	B
13.	Workshop	Others 32	
14.	Library		Binding Equipments Microfilm Equipments Others
15.	Administration	1. Communication System 2. Mainframe Computor System (or 25 Mini-computers) 3. Photography Equipment 4. Others 5	

(Phase - Ⅲ)

AGREED MINUTES OF DISCUSSIONS

ON

SANJAY GANDHI POST GRADUATE INSTITUTE OF MEDICAL SCIENCES PROJECT

In response to the request from the Government of India, the Government of Japan had sent two basic design Study Teams from Japan International Co-operation Agency (JICA) on Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGI) Project in February and April, 1986.

On the basis of the findings of the two preceding missions, JICA sent a study team for explanation of Draft Basic Design Study Report to S.G.P.G.I., the Government of U.P. and Government of India from 6th to 14th August, 1986, headed by Dr. Yoshi Hirose, Director, Office of Medical Technology Development, Ministry of Health & Welfare, Government of Japan.

The team had a series of discussions on the project with the concerned officials of Government of India, State of Uttar Pradesh and S.G.P.G.I. and explained the Draft Basic Design Study report, which was finalised with mutual agreement.

../..

As a result of this study, both parties agreed that the major points of understanding which are attached herewith, need to be considered towards the realisation of the project.

August 14, 1966.

Dr. Yoshi Hirose)
Leader of Japanese Team

(D. Chatterjee)
Joint Secretary
Ministry of Finance
Department of Economic Affairs

(N.S. Bakshi)
Director
Ministry of Health & Family Welfare

MAJOR POINTS OF UNDERSTANDING

1. Grant-in-aid

The Indian side was satisfied with the listing of equipments in Category A, with A_1 list to be supplied in the first year and A_2 in the 2nd year. However, minor changes were suggested in A_1 and A_2 lists on the basis of discussions regarding the need of equipments. Japanese side agreed to consider incorporating amended lists A_1 and A_2 in Final Basic Design Study Report.
(The proposed list is Annexed).

2. Both sides agreed to the following :

(a) After presentation of Basic Design Study report & signing of Exchange Note (E/N) necessary steps will be taken by both sides to expedite the formalities for grant aid.

(b) Japanese side understands that S.G.P.G.I. has taken all necessary steps required for clearance from customs and import.

(c) Both sides agreed that for smooth implementation of the Grant-in-Aid project, it would be preferable to engage a Japanese consultant for tendering and other formalities.

(d) Indian side studied the implementation schedule proposed by the Japanese side and requested that considering the urgency of the equipments it should be reduced by 2 to 3 months and Japanese

side agreed to give due consideration to this request.

(e) The Study Team confirmed that the construction work at SGPGI site is progressing smoothly according to the original construction schedule and that in view of this progress, there will be no problem at the time of importation and installation of medical and other equipment needed for SGPGI.

(f) Japanese side suggested that mobilisation of medical and technical staff should be expedited.

(g) In order to procure equipment for the project as early as possible, efforts should be made to split the equipment list so that readily available equipment can be shipped immediately, for delivery before 31st March, 1987. Proposed list of such equipment is in Annexure 2.

II. TECHNICAL COOPERATION

The Japanese team confirmed SCPSI's request for technical cooperation and explained the scheme to the Indian side.

The Japanese team suggested that a team of 6 medical department leaders should immediately visit Japan for familiarisation with Japanese institutions and for discussion on the scope of technical cooperation with the Japanese side. Thereafter, the Government of Japan will despatch a mission within this fiscal year to consider the program of technical cooperation in the field of medical research and education between the two countries.

The Indian side agreed with the suggestion and requested the Japanese team that two separate teams, consisting each of three doctors and one administrator should visit Japan between Ist November, 1986 and 15th February, 1987. Individual applications for the first team will be sent by 15th September and for the 2nd team by 15th December, 1986. The Japanese team agreed to consider this request.

August 12, 1986.

EQUIPMENT LIST IN BASIC DESIGN STUDY FOR SGPGI,INDIA.

1. The study team confirmed attached equipment list based on the discussion with the study team and staff/consulting Doctors of SGPGI.

Annexure No.1 &
Annexure No.2.

2. The Study Team confirmed to procure the additional equipment, if the offered price is below the budget as the result of the tender.

Annexure No.3 &
Annexure No. 4.

3. The Study Team confirmed to make minor necessary adjustments in Radiological equipment to accomodate items of Annexure 3 & Annexure 4, if required according to budgetary resources.

S.S. Agarwal
DR. S.S. AGARWAL
DEAN, SGPGI.

Yoshihisa Watanabe
MR. YOSHIHISA WATANABE
MEMBER OF JICA MISSION

B.B. Sethi
DR. B.B. SETHI
DIRECTOR, SGPGI

Yoshi Hirose
DR. YOSHI HIROSE
LEADER OF JICA MISSION

ANNEXURE I

SELECTION LIST

FOR

SANJAY GANDHI POST GRADUATE INSTITUTE

** **

A1 LIST
FIRST STAGE

86/06/22

INSTITUTE OF HOSPITAL SYSTEM DEVELOPMENT

1. Neuro-Sciences

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Typ
1	8ch Portable EEG Machine	Physiological Test, Monitors	1	①②⑤	①	④
2	18ch & 2 Marker ch. EEG Machine	Physiological Test, Monitors	1	①②③	①	④
3	4ch EMG Machine	Physiological Test, Monitors	1	①②③	②	①
4	Slit-Lamp Microscope	Diagnosis,Treat-ment Equipment	1	①②③	①	③
5	Illuminated Perimeter	Diagnosis,Treat-ment Equipment	2 ~~1~~	①②④	①	④
6	Mydriatic Type Eye Fundus Camera	Diagnosis,Treat-ment Equipment	1	①②③	①	④
7	Audiometer (General)	Diagnosis,Treat-ment Equipment	3	①②③	①	④
8	Applanation Tonometer (Hand)	Diagnosis,Treat-ment Equipment	2	①②③	①	③
9	Halogen Ophthalmoscope	Diagnosis,Treat-ment Equipment	16	①③	①	④
10	Halogen Diagnostic Set	Diagnosis,Treat-ment Equipment	9	①③	①	④
~~11~~	~~Automatic Stapler Quadriplegic (bed) Frame~~	~~Diagnosis,Treat-ment Equipment~~	~~8~~	~~①~~	~~①~~	~~④~~

BASIC DESIGN LIST FOR SANJAY GANDHI POST GRADUATE INSTITUTE First Sta
page.

2. Cardiac-Sciences

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trr.
1	1ch ECG	Physiological Test, Monitors	4	①②③	①	④
2	3ch ECG (Portable)	Physiological Test, Monitors	1	①②③	①	④
3	3ch ECG (Standard)	Physiological Test, Monitors	1	①②③	①	④
4	Echocardiograph	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
5	Broncho Fiberscope	Endoscopes	1-2-	①	③	④

3. Gastroenterology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Upper Gastrointestinal Fiberscope	Endoscopes	3~~2~~	①②	②	④
2	Duodeno Fiberscope	Endoscopes	2~~1~~	①②	②	④
3	Lower Gastrointestinal Fiberscope	Endoscopes	2~~3~~	①②	②	④
4	Endoscopes	Endoscopes	~~3~~7	①	①	④

4. Nephrology-Urology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Haemodialysis Machine	Dialysis Equipment	8 ~~4~~	①②	①	①
2	Dialyzers & Arterio Venous Lines	Dialysis Equipment	~~80~~ 200	①②	①	①
3	Automatic Peritoneal Dialysis Machines	Dialysis Equipment	6 ~~3~~	①②	①	①
4	Multipoint Dialysers	Dialysis Equipment	5 ~~3~~	①②	①	①
5	Central Water Supply for Dialysis	Dialysis Equipment	2	①②	①	①
6	Revers Osmosis Equipment, 10 Dialysis	Dialysis Equipment	1 ~~2~~	①②	①	①
7	Booster Pump Systems w/Automatic Cut-off	Dialysis Equipment	1	①②	①	①
8	Acute Peritoneal Dialysis Catheters	Dialysis Equipment	10 ~~8~~	①②	①	④
9	Chronic Tenckhoff Catheters (PD Cathetera)	Dialysis Equipment	420 ~~8~~	①②	①	④
10	Dialyzer Re-use Machine	Dialysis Equipment	1	①②	①	①
11	Blood Pump	Dialysis Equipment	5 ~~2~~	①②	①	①
12	Extra Heparin Infusion Pumps	Dialysis Equipment	6 ~~3~~	①②	①	①
13	Portable Bed Scales for Dialysis Patients	Dialysis Equipment	2	①②	①	④
14	Dialysis Weigh Bed	Dialysis Equipment	12 ~~5~~	①②	①	①
15	Dialysis Chairs	Dialysis Equipment	4 ~~2~~	①②	①	④
16	Cystoscope	Endoscopes	3 ~~2~~	①②③	①	④
17	Paediatric Cystoscope	Endoscopes	2 ~~1~~	①②③	①	④
18	Resectoscope Complete Set	Endoscopes	2 ~~1~~	①③	①	④
19	Pediatric Resectoscope Set	Endoscopes	2 ~~1~~	①②③	①	④

5. Endocrinology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Typ
1	UV/VIS Spectrophotometer (Double Beam)	Analytical Instruments	1	①②	①	③
2	Spectro-Photofluorometer	Analytical Instruments	1	①②	③	③
3	Dextrometer	Automated Analyzers	1	①②	①	④
4	PH Meter	Analytical Instruments	1	①②	②	④
5	Polyacrylamid Gel Electrophoresis Apparatus	Electrphoresis, Chromatography	1	①②	③	④
6	Densitometer w/ Recorder	Electrphoresis, Chromatography	1	①②	②	⑤
7	Thin Layer Chromatography Equipment	Electrphoresis, Chromatography	1	①②	②	④
8	Fluorescence Microscope	Microscopes	1	①②	③	④
9	Exophthalmometer	Diagnosis,Treat-ment Equipment	1	①②	①	④
10	Ophthalomoscope	Diagnosis,Treat-ment Equipment	1	①②	①	④
11	2ch Insulin Pump	Diagnosis,Treat-ment Equipment	1	①②	②	②
~~12~~	~~Ventilator~~	~~Diagnosis,Treat-ment Equipment~~	~~1~~	~~①②~~	~~①~~	~~④~~
13	Cryomicrotome (-70°C)	Analytical Equipment	1	①②	①	③
~~14~~	~~Tissue Processor~~	Analytical Equipment	~~1~~	~~①②~~	~~①~~	~~④~~
15	Water Bath	Analytical Equipment	1	①②	①	④
16	Incubator, Waterbath	Analytical Equipment	1	①②	①	④
17	Automatic Incubator, Dilutor, Dispenser	Analytical Equipment	1	①②	③	④
18	Electronic Balance	Analytical Insiruments	1	①②	①	④
19	Metabolic Shakers	Analytical Equipment	1	①②	③	④
20	Automatic Syringe	Analytical Equipment	4	①②	①	④
21	Vacuum Pumps	Analytical Equipment	1	①②	①	④
~~22~~	~~Muffle Furnaces~~	~~Analytical Equipment~~	~~1~~	~~①②~~	~~①~~	~~④~~
~~23~~	~~Ultrasonic Cleaners~~	~~Analytical Equipment~~	~~1~~	~~①②~~	~~①~~	~~④~~
~~24~~	~~Pipet Washer Ultrasonic~~	~~Analytical Equipment~~	~~1~~	~~①②~~	~~①~~	~~④~~
25	General Purpose Low-speed Refrigerated Centrifuge	Centrifuges	1	①②	①	③

5. Endocrinology

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	In Tr
1	CO2 Incubator	Analytical Equipment	1	①②	③	③
2	Deep Freezer (-70°c)	Analytical Equipment	1	②	①	①
3	Fume-Hood for RIA	Analytical Equipment	1	②	③	③
~~4~~	~~Fume-Hood for Bio-chemistry~~	Analytical Equipment	~~1~~	~~②~~	~~②~~	~~②~~
5	Water Still	Analytical Equipment	1	②	①	③

Automated Beta Counter 1

ELISA Reader 1

High Speed Refrigerated Centrifuge 1

6. Genetics-Immunology

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	Ins: Trng
1	Ophthalmic Eqipment	Diagnosis,Treatment Equipment	5	①②③	①	④
2	Hand Held Fundus Camera	Diagnosis,Treatment Equipment	2	②	②	④
3	Nephelometer	Analytical Instruments	1	②	②	④
4	Micro-Flow Spectrophotometer	Analytical Instruments	1	②	②	④
5	Double Beam Recording UV-Vis Spectrophotometer	Analytical Instruments	2	②	②	③
6	Spectrofluorometer for Clinical Chemistry	Analytical Instruments	1	②	②	①
7	Atomic Absorption Spectrophotometer	Analytical Instruments	1	②	②	①
8	Electrophoresis Equipment	Electrphoresis, Chromatography	2	②	②	④
9	Cellulose Acetate & Immuno-electrophoresis	Electrphoresis, Chromatography	1	②	②	④
10	Multiphore Complete System	Electrphoresis, Chromatography	2	②	②	④
11	Cell Electrophoresis Apparatus	Electrphoresis, Chromatography	1	②	②	④
12	Densitometer	Electrphoresis, Chromatography	1	②	②	③
13	Thin Layer Chromatography Equipment	Electrphoresis, Chromatography	1	②	②	④
14	Routine Binocular Bright Field Microscope	Microscopes	~~14~~	②	①	④
~~15~~	~~Inverted Microscope (Routine)~~	Microscopes	~~5~~ 3	③	②	④
16	Hematocrit Centrifuge	Centrifuges	2	②	②	④
17	General Centrifuge	Centrifuges	8	②	①	④
18	CO2 Incubator	Analytical Equipment	~~10~~ 4	②	②	③
19	BOD Incubator (Cooled Incubator)	Analytical Equipment	1	②	②	③
20	Incubator, Low Temperature	Analytical Equipment	1	②	①	④
21	Incubator	Analytical Equipment	1	②	①	④
22	Refrigerater Chromatography Chamber	Analytical Equipment	1	②	②	③
23	Refrigerater (with see-through door)	Analytical Equipment	1	②	②	④
24	Water Purification System	Analytical Equipment	1	②	①	③
25	Liquid Handling System	Analytical Equipment	5 ~~10~~	②	②	④

6. Genetics-Immunology

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	Ins Trn
1	Automatic Diluter/Dispenser	Analytical Equipment	2	①②③	②	④
2	Micropipettes	Analytical Equipment	5→3	②	①	④
3	Multichannel Micropipettes	Analytical Equipment	14→5	②	①	④
4	Universal Pipetting Aid	Analytical Equipment	6→2	②	①	④
5	Fume Hood, Portable/Table	Analytical Equipment	6→2	②	②	④
~~6~~	~~Timer for Dark Room~~	Administration, AV Equipment	~~2~~	~~②~~	~~②~~	~~④~~
7	[illegible]	Analytical Equipment	20→4	[illegible]	[illegible]	[illegible]
8	Shaker for Separatory Funnel	Analytical Equipment	2→1	②	②	④
9	Ice Machine, flaked Ice	Analytical Equipment	4→1	②	③	③
10	Mixer, Magnetic	Analytical Equipment	20→1	②	①	④
11	Water Bath, Low Temperature	Analytical Equipment	2→1	②	①	④
12	Water Bath, Shaking	Analytical Equipment	2→1	②	①	④
13	Oven	Analytical Equipment	6→2	②	①	④
14	Vacuum Oven	Analytical Equipment	2→1	②	②	④
15	Pipet Dryer	Analytical Equipment	1	②	①	④
~~16~~	~~Muffle Furnace~~	~~Analytical Equipment~~	1	②	①	④
17	Heating Blocks	Analytical Equipment	20→2	②	②	④
18	Timers w/Alarm	Analytical Equipment	72→8	②	①	④
19	Digital Stop Watch	Analytical Equipment	72→8	②	①	④
20	Ultrasonic Cleaner	Analytical Equipment	4→1	②	①	④
21	Misc. Tissue Culture Equipment	Analytical Equipment	1	②	②	④
22	Clean Bench	Analytical Equipment	1	②	②	③
23	Ultrasonic Pipet Washer	Analytical Equipment	2→1	②	①	④
24	Vacuum Pump	Analytical Equipment	8→2	②	①	④
25	Homogenisers (Grinder)	Analytical Equipment	12→3	②	①	④

6. Genetics-Immunology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Micro Tube Mixer	Analytical Equipment	6	① ② ③	①	④
2	Stirrers	Analytical Equipment	6	②	①	④
3	Magnetic Stirrer w/Hot Plate	Analytical Equipment	20	②	①	④
4	Blood Cell Counter-Routine Laboratory	Analytical Equipment	~~5~~ 4	②	②	④
5	Slide Warmer	Analytical Equipment	2	②	②	④
6	Electronic Balance	Analytical Instruments	~~26~~ 13	②	①	④
7	[illegible]	Analytical Instruments	12	②	①	④
8	PH Meter (.001)	Analytical Instruments	2	②	①	④

Water Demineralizer/Stillo 4

7. Central 1)Pathology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Tra
1	Multi-Channel Analyser	Automated Analyzers	1	①	①	①
2	Single ch-Multiple Chemistry Analyser	Automated Analyzers	1	①	①	①
3	Blood Gas Analyser	Automated Analyzers	1	①	①	①
4	Sodium/Potassium/~~Calcium~~ Chloride Analyser	Automated Analyzers	1	①	①	①
5	Calcium/Magnesium Meter	Automated Analyzers	1	①	①	④
6	~~Glucose Analyser~~	Automated Analyzers	~~1~~	~~①~~	~~①~~	~~①~~
7	~~Spectrophotometers w UV & Vis Attachment~~	Analytical Instruments	~~1~~	~~①~~	~~①~~	~~①~~
8	Visual Range Spectrophotometer	Analytical Instruments	3	①	①	④
9.	~~Flame Photometer~~	Analytical Instruments	~~1~~	~~①~~	~~①~~	~~①~~
10.	~~Fluorometer~~	Analytical Instruments	~~1~~	~~①~~	~~①~~	~~①~~
11	Dispenser	Analytical Equipment	1	①	①	④
12	Digital Diluter /Pipetter	Analytical Equipment	1	①	①	④
13	Laboratory Centrifuge	Centrifuges	2	①	①	④
14	Blood Cell Analyser	Automated Analyzers	1	①	①	①
15.	Automatic Differential Leukocyte Counter	Automated Analyzers	~~1~~	~~①~~	~~①~~	~~①~~
16	Hematocrit Centrifuge	Centrifuges	2	①	①	④
17	Differential Leukocyte Counter	Analytical Equipment	12	①	①	④
18	Digital Clot Timer	Analytical Instruments	1	①	①	④
19	Platelet Aggregation Meter	Analytical Instruments	1	①	①	④
20	Micro Centrifuge	Centrifuges	1	①	①	④
21	Low-speed Refrigerated Centrifuge	Centrifuges	1	①	①	③
22	Gel Electrophoresis	Electrphoresis, Chromatography	1	①	①	④
23	Densitometer	Electrphoresis, Chromatography	1	①	①	③
24	Autosera Dot	Analytical Instruments	1	①	①	④
25	Colony Counter	Analytical Instruments	1	①	①	①

7. Central 1)Pathology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Tr
1	Phase Contrast Microscopes	Microscopes	1	①	①	③
2	Fluorescence Microscopes	Microscopes	1	①	②	③
3	High-speed Refrigerated Centrifuge	Centrifuges	1	①	①	③
4	CO2 Incubator	Analytical Equipment	1	①	①	③
5	Anaerobic Incubator	Analytical Equipment	1	①	①	③
6	Biohazard Hoods	Analytical Equipment	1	①	①	③
7	Deep Freezer (-80°C)	Analytical Equipment	3	①	①	③
8	Tissue Homogeniser	Analytical Equipment	2	①	①	④
9	Tissue Processor	Analytical Equipment	1	①	①	①
10	Cytocentrifuge	Analytical Equipment	1	①	①	③
11	Slide Stainer	Analytical Equipment	1	①	①	④
12	Ultra Processor	Analytical Equipment	2	①	①	①
13	Cryomicrotome	Analytical Equipment	1	①	①	③
14	Ultra Microtome	Analytical Equipment	1	①	①	④
15	Large Sect. Microtome	Analytical Equipment	1	①	①	④
16	Binocular Research Microscope (Special)	Microscopes	1	①	①	④
17	Binocular Reseerch Microscope	Microscopes	16	①	①	④
18	Binocular Laboratory Microscope	Microscopes	10	①	①	④
19	Digital Balance	Analytical Instruments	4	①	①	④
20	PH Meter	Analytical Instruments	2	①	①	④
21	Magmetic Stirrer	Analytical Equipment	6	①	①	④
22	Touch Mixer	Analytical Equipment	4	①	①	④
23	Micro Tube Mixer	Analytical Equipment	2	①	①	④
24	Ultrasonic Pipet Washer	Analytical Equipment	2	①	①	④
25	Bottle Washer	Analytical Equipment	5	①	①	③

7. Central 1)Pathology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Glassware Dryer	Analytical Equipment	3	①	①	④
2	Water Demineraliser /Stills	Analytical Equipment	2	①	①	⑤
3	Ice Cube. Maker	Analytical Equipment	3	①	②	③
4	Timer	Analytical Equipment	8	①	①	③
5	Small Equipment	Analytical Equipment	34	①	①	③
6	Laminar Flow Benche	Analytical Equipment	6	①	①	③
~~7~~	~~Photocopying Machine~~	Administration, AV Equipment	~~1~~	~~③~~	~~③~~	~~④~~
8	Audio-visual Equipment	Administration, AV Equipment	3	①②③	①	④

ELISA apparatus 1

7. Central 2)Radiology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Whole Body CT Scanner	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
2	Biplane Abdominal Angiographic Unit w/D.S.A.	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	①
3	Bucky Radiography & Planigraphy	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
4	Remote Controlled Unit for Gastroenterology	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
5	Myelography Unit	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	③
6	X-Ray Unit for Skull Radiography	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	③
7	Urological X-Ray Diagnostic Unit	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	③
8	Pediatric X-Ray Equipment	X-ray Diagnosis, Ultasonic Equip.	2	①②③	②	③
9	Mammography Unit	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	③
10	Mobile Condensor Discharge High Power Unit	X-ray Diagnosis, Ultasonic Equip.	3	①②③	①	③
11	Mobile C-arm Image Intersifier	X-ray Diagnosis, Ultasonic Equip.	3	①②③	①	③
12	Ultra Sound Unit	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
13	Ultra Sound Equipment Convex/linear	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
14	Portable Ultra Sound Unit (Linear/Sectors)	X-ray Diagnosis, Ultasonic Equip.	2	①②③	①	①
15	Ultrasound Unit Convex/linear for Genetic Lab	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	①
16	Mobile Ultra Sound Unit (Linear/Sectors)	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
17	Densitometer & Sensitometer	Nuclear Medecine Equipment	1	①②③	②	④
18	Dark Room Accessories	X-ray Diagnosis, Ultasonic Equip.	2	①②	①	③
19	Misc. Instruments Equipment for Radiology	X-ray Diagnosis, Ultasonic Equip.	1	①②	①	③

7. Central 3)Operation

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Operating Light	Surgical Operation Equipment	~~13~~ 16	①②③	①	④
2	Operating Table	Surgical Operation Equipment	~~9~~ 12	①②③	①	③
3	Anaesthesia Machine/Monitor/Polygraph	Surgical Operation Equipment	~~11~~ 14	①②③	①	①
4	Electro Surgical Unit	Surgical Operation Equipment	9	①②③	①	④
5	Operating Microscope	Surgical Operation Equipment	3	①②③	②	③
6	CO2 Monitor/Blood Pressure Monitor	Surgical Operation Equipment	6	①②③	①	③
7	Washer Steriliser	Facility Other Equipment	1	①	②	③
8	Infusion Pump	Surgical Operation Equipment	7	①	①	④
9	Sternal Saw	Surgical Operation Equipment	2	①	②	④
10	Intra-Native Bulloon Pump	Surgical Operation Equipment	1	①	②	④
11	Electromagnetic Flow Meter	Surgical Operation Equipment	1	①	②	④
12	Heart Lung Machine	Surgical Operation Equipment	2	①	③	①
13	Fibrillator	Surgical Operation Equipment	3	①	③	④
14	Oxymeter (On-line and for Sample Studies)	Surgical Operation Equipment	2	①③	③	④
15	Endomyocandial Biopsy Catheter	Surgical Operation Equipment	~~4~~ 8	①②③	③	④
16	Heart Valves	Surgical Operation Equipment	4	①	②	④
17	Magnification Loupe w/Fiberoptic Illuminator	Surgical Operation Equipment	6	①	②	④
18	Stryker Operations Chair	Surgical Operation Equipment	15	①	②	④
~~19~~	~~Overhead Instruments Trolly (Neurosurgical)~~	~~Surgical Operation Equipment~~	~~2~~	~~①~~	~~②~~	~~④~~
20	Electrocorticography Machine	Surgical Operation Equipment	1	①	②	④
21	Ultrasonic Surgical System	Surgical Operation Equipment	1	①	③	①
22	Laser Nd YAG	Surgical Operation Equipment	1	①	②	④
23	Laser CO2	Surgical Operation Equipment	1	①	②	④
24	General Neurosurgical Instrument	Surgical Operation Equipment	~~3~~ 1	①	②	④
25	Microsurgery Instruments	Surgical Operation Equipment	3	①	②	④

7. Central 3)Operation

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Brain Self Retaining Retractor	Surgical Operat-ion Equipment	2	①	②	④
2	Instrument & Equipment	Surgical Operat-ion Equipment	1	①	②	④
3	Micro-Neurosurgical Equipment	Surgical Operat-ion Equipment	1	①	②	④
~~4~~	~~Equipment for Cryo Surgery in Urology~~	~~Surgical Operat-ion Equipment~~	~~1~~	~~①~~	~~②~~	~~④~~
5	Electro Surgical Unit for T.U.R.	Surgical Operat-ion Equipment	2	①	②	④

Urological Endoscopy Table 2

7. Central 4)ICU

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Multichannel Monitors (ICU)	Physiological Test, Monitors	~~11~~ 22	①②③	①	①
2	Multichannel Monitors (Ward)	Physiological Test, Monitors	7	①②③	②	①
3	Arrhythimia Monitor	Physiological Test, Monitors	2	①②③	②	①
4	Central Monitoring System	Physiological Test, Monitors	4 ~~5~~	①②③	①	①
5	Ventillators (Intensive Care)	Diagnosis,Treat-ment Equipment	5	①	①	①
6	Nebulizer	Diagnosis,Treat-ment Equipment	5	①	①	④
7	Incubators (Infant)	Diagnosis,Treat-ment Equipment	3	①	③	①
8	Portable Defibrillator	Diagnosis,Treat-ment Equipment	9	①	②	④
9	Microtransfuser	Diagnosis,Treat-ment Equipment	18	①	①	④
10	Special Intensive Care Beds	Diagnosis,Treat-ment Equipment	22	①	①	③
11	pH & Blood Gas Analyser	Automated Analyzers	1	①②	①	①

7. Central 5)Ward

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trng
1	Equipments for Ward	Diagnosis,Treat-ment Equipment	4	①②③	①	④

7. Central 6)Physical

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Equipment for Physical Medicine & Rehabilitation	Diagnosis,Treat-ment Equipment	~~22~~ 30	①②③	②	③
2	Pulmonary Function Complete System	Physiological Test, Monitors	1	①②③	②	①

7. Central 7)Supply

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Inst Trng
1	Equipment for Central Supply Room	Facility,Other Equipent	24	①②	①	①

7. Central 8)Autopsy

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Equipment for Autopsy Room	Analytical Equipment	13	②③	②	②

7. Central 9)Animal House

No.	Equipment Name	Type of Equipment	NO of Unit	Objecti-ive	Freq Use	Ins Trn

7. Central 13)Work Shop

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	Ins Trn
1	Digital Oscilloscope, Double Beam, 100MHz	Facility,Other Equipment	1	④	③	④
2	Osilloscope, 10MHz	Facility,Other Equipment	3	④	③	④
3	Digital Multimeter ~~6~~ 4 -1/2 Digit	Facility,Other Equipment	2	3 ~~④~~	③	④
4	Digital Multimeter (Portable) 3-1/2 Digit	Facility,Other Equipment	3	10 ~~④~~	③	④
5	Solder Iron & Aspirator & Stand (Solder Station)	Facility,Other Equipment	9	18 ~~④~~	③	④
6	Test Zigs for Various Instruments Mother Board	Facility,Other Equipment	1	④	③	④

7. Central 15)Administration

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins: Trng
1	Photographic Equipment	Administration, AV Equipment	2 1	①②③	②	①

ANNEXURE 2

SELECTION LIST

FOR

SANJAY GANDHI POST GRADUATE INSTITUTE

** version 2.0 **

A2
~~TOTAL~~ LIST
(2nd phase)

86/06/22

INSTITUTE OF HOSPITAL SYSTEM DEVELOPMENT

1. Neuro-Sciences

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	Inst Trng
1	Compressed Spectral Array EEG Monitor	Physiological Test, Monitors	1	①	①	①
2	8ch EMG Evoked Potential	Physiological Test, Monitors	1	①②③	②	②
~~3~~	~~2ch Neuro-Myograph~~	Physiological Test, Monitors	~~1~~	~~①②③~~	~~③~~	~~②~~
~~4~~	~~4ch Evoked Potential System~~	Physiological Test, Monitors	~~1~~	~~①②③~~	~~②~~	~~①~~
~~5~~	Ophtalmic Ulterasonic A & B Scan	X-ray Diagnosis, Ultasonic Equip.	~~1~~	~~①②③~~	~~①~~	~~④~~
~~6~~	~~Electro-Oeculography Machine~~	Diagnosis,Treatment Equipment	~~1~~	~~①②③~~	~~②~~	~~④~~
~~7~~	Evoked Potential Equipment per Operative	Physiological Test, Monitors	1	①②③	②	③
~~8~~	~~Racia Rotation Chair~~	Diagnosis,Treatment Equipment	~~1~~	~~①②④~~	~~①~~	~~④~~
9	Electric / Pneumatic Craniotome	Diagnosis,Treatment Equipment	1	①	①	④
~~10~~	~~Trutax Traction Equipment~~	Diagnosis,Treatment Equipment	~~2~~	~~①~~	~~①~~	~~④~~
11	Combined Retractor & Handrest	Diagnosis,Treatment Equipment	1	①③	①	④
12	Telemeter Intracranial Pressure Monitor	Diagnosis,Treatment Equipment	1	②	③	④

Automatic Striker Bed Frame 4

2. Cardiac-Sciences

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	3ch ECG (Computer Analysis)	Physiological Test, Monitors	2	②③	①	①
2	24 hrs Holter Monitoring System	Physiological Test, Monitors	5	①②③	①	①
3	Multichannel Monitor & Recorder	Physiological Test, Monitors	1	①②	①	①
4	Cardiac Telemetry System (4bed)	Physiological Test, Monitors	1	①	①	①
5	Pacemaker System Analyser	Physiological Test, Monitors	1	①②	③	①

3. Gastroenterology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Upper Gastrointestinal Panendoscopes	Endoscopes	2-4	①②	②	④
2	Teaching Aids for Endoscopy	Endoscopes	1	③	②	④
~~3~~	~~Laparoscopes~~	Endoscopes	~~1~~	~~①②~~	~~③~~	~~④~~
4	Choledocho Fiberscopes	Endoscopes	2	①②	③	④
5	Video Endoscopes	Endoscopes	2	①②	③	①

5. Endocrinology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	HbA1C Analyser	Automated Analyzers	1	①②	①	③
~~2~~	~~Double Beam Atomic Absorption Spectrophotometer~~	~~Analytical Instruments~~	~~1~~	~~①②~~	~~②~~	~~①~~
~~3~~	~~Automated Beta Scintillation Counter~~	~~Nuclear Medecine Equipment~~	~~1~~	~~①②~~	~~③~~	~~①~~
~~4~~	~~Automated Gamma Counter~~	~~Nuclear Medecine Equipment~~	~~1~~	~~①②~~	~~③~~	~~①~~
5	High Performance Liquid Chromatography	Electrphoresis, Chromatography	1	①②	③	③
6	Column Chromatography Equipment	Electrphoresis, Chrocatography	1	①②	③	③
7	Fast Protein, Polypeptide Liquid Chromatography	Electrphoresis, Chromatography	1	①②	③	①
~~8~~	~~ELISA Reader~~	~~Automated Analyzers~~	~~1~~	~~①②~~	~~①~~	~~①~~
9	Sonnicators (Ultrasonic Tissue Processer)	Analytical Equipment	1	①②	①	③
~~10~~	~~High-speed Refrigerated Centrifuge~~	~~Centrifuges~~	~~1~~	~~①②~~	~~①~~	~~①~~
11	High Speed Low Temperature Centrifuge	Centrifuges	1	①②	③	③
12	Vacuum Ovens	Analytical Equipment	1	①②	②	③
13	Refrigerated Chromatography Chamber	Analytical Equipment	1	②	②	③
14	Deep Freezer (-80°c,General)	Analytical Equipment	1	②	①	③
	Cryomicrotome		1			
	Tissue processor		1			
	Muffle Furnace		1			
	Ultrasonic cleaner		1			
	Pipet Washer		1			
	Fume Hood		1			

6. Genetics-Immunology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Tr
1	Liquid Scintillation Counter	Nuclear Medecine Equipment	1	① ② ③	①	①
2	Gamma Counter	Nuclear Medecine Equipment	1	②	①	①
3	Multigamma	Nuclear Medecine Equipment	1	②	①	①
4	Phagocytosis Investigation System	Analytical Instruments	1	②	①	①
5	Fast Protein Liquid Chromatography System	Electrphoresis, Chromatography	1	②	①	③
6	Preparative HPLC	Electrphoresis, Chromatography	1	②	①	①
7	Gas Liquid Chromatograph	Electrphoresis, Chromatography	1	②	①	①
8	DNA Sequensing Computer	Analytical Instruments	1	②	①	①
9	Fluorescence Microscope-Rejected Light	Microscopes	1	②	①	④
10	Research Microscope w/Image Analysis system	Microscopes	1	②	①	①
11	Inverted Microscope (Specialty)	Microscopes	1	②	①	①
12	Low-speed Refrigerated Centrifuge	Centrifuges	2	②	①	①
13	High-speed Refrigerated Centrifuge	Centrifuges	2	②	①	③
14	Cyto Centrifuge	Analytical Equipment	1	②	①	①
15	Aerofuge	Centrifuges	1	②	①	③
16	Ultralow Deep Freezer	Analytical Equipment	6	②	①	④
17	Freeze Dryer	Analytical Equipment	1	②	①	②
18	Semi-automated 8 Parameter Blood Cell Counter	Automated Analyzers	1	②	①	①
19	Auto Sera Dot	Analytical Instruments	1	②	①	④
20	ELISA Reader	Automated Analyzers	1	②	①	①
21	Sera Washer	Analytical Equipment	1	②	①	①
22	Cytofluorometer	Automated Analyzers	1	②	①	①
~~23~~	~~Fluorescence Activated Cell Sorter~~	~~Automated Analyzers~~	~~1~~	~~②~~	~~①~~	~~①~~
24	Colony Analyscr System	Automated Analyzers	1	②	①	①
~~25~~	~~Zone Reader (Manual)~~	~~Analytical Equipment~~	~~1~~	~~②~~	~~①~~	~~①~~

6. Genetics-Immunology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
1	Filteration Equipment for Sterilization	Analytical Equipment	1	②	②	④
2	Ultrafilteration Equipment	Analytical Equipment	1	②	②	③
3	Automatic Staining Machine	Analytical Equipment	1	②	②	①
4	Laboratory Air Cleaner	Analytical Equipment	1	②	①	④
5	Safety Cabinet	Analytical Equipment	1	②	②	④
6	Fraction Collector	Analytical Equipment	2	②	②	④
7	Peristaltic Pump	Analytical Equipment	1	②	②	④
8	Centrifugal Evaporator	Analytical Equipment	1	②	②	③
9	Speed Vacuum Concentrator	Analytical Equipment	1	②	②	④
10	Refractometer	Analytical Equipment	3	②	②	④
11	Slide Cleaner (Vibrator)	Analytical Equipment	1	②	②	④
42	Personal Computer	Administration, AV Equipment	1	②	②	④

7. Central 1)Pathology

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins Trn
~~1~~	~~Hemoglobin Analyser~~	~~Automated Analyzers~~	~~1~~	~~①~~	~~②~~	~~④~~
2	~~Scanning~~ Transmission Electron Microscope	Microscopes	1	①	③	①
3	Preparative Ultra Centrifuge	Centrifuges	1	①	②	③
4	Inverted Microscope	Microscopes	1	①	①	④
5	Polarising Microscopes	Microscopes	1	①	①	④
6	Accessory Equipment for EM	Analytical Equipment	1	①	③	④
7	Spray Dryer	Analytical Equipment	1	②	③	④

7. Central 2)Radiology

No.	Equipment Name	Type of Equipment	NO of Unit	Objective	Freq Use	Ins Trn
1	Biplane Cine Cardioangiographic w/D.S.A.	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	①
2	Biplane Cerebral Angiographic Unit w/D.S.A.	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	①
3	Mass Chest X-Ray Equipment	X-ray Diagnosis, Ultasonic Equip.	1	①②③	②	③
4	Computed Radiographic System	X-ray Diagnosis, Ultasonic Equip.	1	①②③	①	①
5	Projectors, TV/Video Tape Recorder/Screen	Administration, AV Equipment	4	②③	②	④
6	Linear Accelerator & Dosimeter	Radiology Treatment Equip.	1	①②	②	①
7	After Loading Bracky Therapy Unit	Radiology Treatment Equip.	1	①②	③	①
8	Teletherapy Simulator	Radiology Treatment Equip.	1	①②③	②	①
9	Gamma Camera	Nuclear Medecine Equipment	2 → 1	①②③	①	①
10	Automatic Gamma Multisample Counter	Nuclear Medecine Equipment	1	①②	①	①
11	Isotope Dose Calibrator & Reference Source	Nuclear Medecine Equipment	1	①②	②	④

Cine Film Developing Apparatus 1

7. Central 4)ICU

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Inst Trng
1	Ion Analyser	Automated Analyzers	1	①②	①	①
2	Oxymeter	Automated Analyzers	1	①②	①	④
3	8 Parameter Semiautomated Haematology Analyser	Automated Analyzers	1	①②	①	①
4	Osmometer	Analytical Instruments	1	①②	①	④
5	Microscope	Microscopes	1	①②	①	④
6	Centrifuge	Centrifuges	1	①②	①	④

Clinical Spectrophotometer 1

7. Central 13)Work Shop

No.	Equipment Name	Type of Equipment	NO of Unit	Object-ive	Freq Use	Ins: Trng
1	Digital Storage 2ch Oscilloscope w/Recorder	Facility,Other Equipment	1	④	③	④
2	Logic Analyzer w/Universal Test Board	Facility,Other Equipment	1	④	③	④
3	Portable Oscilloscope	Facility,Other Equipment	1	④	③	④
4	Ultrasonic Cutter	Facility,Other Equipment	1	④	③	④
5	Cable Fault Locator	Facility,Other Equipment	1	④	③	④
6	Digital Transient Recorder	Facility,Other Equipment	2 ✣	④	③	④
7	Personel Computer /2 Disk /Printer	Facility,Other Equipment	1	④	③	④
8	Logic Test Probe (Analyser)	Facility,Other Equipment	1	④	③	④

ANNEXURE 3

ADDITIONAL EQUIPMENT, FIRST STAGE

1.	Neuro-Sciences	
	1) T C I Auto Tonograph	1
2.	Cardiac-Sciences	
	1) Stress Test Equipment	1
3.	Nephrology - Urology	
	1) Hemodialysis Machine	2
	2) Automatic Peritoneal Dialysis	1
	3) Multipoint Dialyzer	1
	4) Portable Bed Scale	2
5.	Endocrinology	
	1) Automated Gamma Counter	1
6.	Genetics - Immunology	
	1) Anthropometric Equipment	8
	2) Measure, Height etc.	6
	3) Electronic Digital Caliper	4
	4) Color Blindness chart	4
	5) Double Beam/Dual Wavelength Spectrophotodmeter	1
	6) Routine Binocular Microscope	4
	7) Inverted Microscope (Routine)	1
	8) CO2 Incubator	6
	9) Liquid Handling System	11
	10) Timer for Dark Room	4
	11) Ice Machine (Flaked Ice)	2
	12) Mixer, Magnetic	20
	13) Heating Block	4
	14) Ultrasonic Cleaner	2
	15) Ultrasonic Pipet Washer	4
	16) Homogeniser	6
	17) Magnetic Stirrer W/Hot Plate	28

ANNEXURE 3 (Contd.)

	18) Electronic Balance	22
	19) pH Meter (.01)	6
	20) Bottle Washer	5
	21) Glassware Dryer	3
7-1)	Pathology	
	1) Glucose Analyser	1
	2) Photo Copying Machine	1
7-2)	Radiology	
	1) Xerography Unit for Mammography	1
7-3)	Operation	
	1) Heart valve	4
	2) Electro-Surgical Unit for T.U.R.	1
7-4)	I C U	
	1) Multichannel Monitor (ICU)	2
	2) Intensive Care Bed	2
7-13)	Workshop	
	1) Digital Multimeter 4-1/2 Digit	2
	2) Digital Multimeter 3-1/2 Digit	5
	3) Solder Iron & Aspirator	9
7-15)	Administration	
	1) Copying Machine (Portable)	9
	2) Automated Electronic Typewriter with memory	9
	3) Copying machine (Heavy Duty)	2
	4) Laboratory Wall Clock	240
	5) Drawing Desk with accessories	4
	6) Calculator with Graphic Printer	10
For All Departments		
	1) Spare Parts	A.S.A.P.

ANNEXURE 4

ADDITIONAL EQUIPMENT, SECOND PHASE

1.	Neuro-Sciences	
	1) 8 Ch EMG Evoked potential	2
	2) Electric/Pneumatic Cranitome	1
	3) Combined Retractor & Handrest	1
	4) Telemeter Intracranial Pressure Monitor	1
	5) Auto Refractometer	1
	6) Auto Optester w/Support table & chair	1
	7) Lensometer	1
	8) Synaptophore	1
	9) First ENT Treatment Unit Sapiria w/chair	1
	10) Vestibular Function Testing Apparatus	1
	11) SPL Meter	1
	12) Ophthalmometer	1
	13) Asphereal Lens (14D, 20D, 28D)	1
	14) Sub Normal Vision Aids	1
	15) Vision Tester - Non Space	1
2.	Cardiac - Sciences	
	1) Multichannel Monitor & Recordder	1
	2) Cardiac Output System	1
3.	Gasteroenterology	
	1) Endoscopic LASER Source	1
	2) Oesophageal Dilator	1
	3) Endoscopic Research Equipment	1
	4) Oesophageal pH/Motility System	1
	5) Small Bowel Endoscope (Long)	1
	6) Breath Analyser	1
	7) Spectrophotometer UV/VIS	1
4.	Nephrology - Urology	
	1) Electrohydraulic Lithotriptor	1

ANNEXURE 4 (Contd.)

5.	Endocrinology	
	1) Research Microscope	1
	2) Recording Spectrophotometer	1
	3) LASER Photo coagulation Apparatus	1
	4) Plasma Emission Spectrometer	1
6.	Genetics - Immunology	
	1) Liquid Scientillation Counter	3
	2) Gamma Counter	1
	3) Multi Gamma Counter	1
	4) Fast Protein Liquid Chromatography System	1
	5) Preparative HPLC	1
	6) Fluorescence Microscope - Reflected Light	5
	7) Low-speed Refrigerated Centrifuge	4
	8) High-Speed Refrigerated Centrifuge	4
	9) Cyto Centrifuge	1
	10) Ultralow Deep Freeze	22
	11) Freese Dryer	1
	12) Ultrafiltration Equipment	1
	13) Automated Staining Machine	1
	14) Laboratory Air Cleaner	3
	15) Safety Cabinet	1
	16) Fraction Collector	2
	17) Peristaltic Pump	3
	18) Speed Vacuum Concentrator	1
	19) Slide Cleaner	3
	20) Refrigerated Centrifuge for Plasmaphoresis	
	21) Ultra Centrifuge	4
	22) Amino Acid Analyser	1
	23) 35 mm Projector	2
	24) Overhead Projector	2
	25) Microscope Slide Projector	2

ANNEXURE 4 (Contd.)

	26) Screen 180x180	6
	27) Shaker, Horizontal Rotation	2
	28) Zone Measure	1
	29) Constant Temperature Oven	4
	30) Water Bath	14
	31) Electrophoresis Equipment	2
	32) Routine Binocular Microscope	18
	33) Inverted Microscope	6
	34) General Centrifuge	8
	35) CO2 Incubator	13
	36) Clean Bench	1
	37) Spectrophotometer	3
	38) Table Top Centrifuge	12
7-1)	Pathology	
	1) Scanning Electron Microscope	1
7-2)	Radiology - Whole Body CT Scan	1
7-3)	Operation	
	1) Radio Frequency Generator w/Codatomy Set	1
	2) Laminectome Operation Set	2
	3) Hand Surgery Instrument	1
	4) Cryo - Operative Equipment	2
	5) Pressure / Flow Monitoring Probe, Transducer	2
	6) Stapler	2
	7) Liver Surgery Equipment	1
	8) Rigid Oesophagoscope	1
7-13)	Workshop	
	1) Transient Recorder	1
	2) Personal computer	1
7-15)	Administration	
	1) Microfiling Equipment	2

1. Neuro - Sciences

1) 8ch Portable EEG Machine	1
2) Audiometer (General)	3
3) Applanation Tonometer (Hand)	2
4) Halogen Ophthalmoscope	16
5) Halogen Diagnostic Set	9
	31

2. Cardiac - Sciences

1) 1ch ECG	4
2) 3ch ECG (Portable)	1
3) 3ch ECG (Standard)	1
4) Broncho Fiberscope	1
	7

3. Gastroenteology

1) Upper G.I. Fiberscope	3
2) Duodeno Fiberscope	2
3) Lower G.I. Fiberscope	2
4) Endoscopes	7
	14

4. Nephrology - Urology

1) Cystoscope	3
2) Pediatric Cystoscope	2
3) Resectoscope Complete Set	2
4) Pediatric Resectoscope Set	2
	9

5. Endocrinology

1) Dextrometer	1
2) pH Meter	1
3) Exophthalmometer	1
4) Ophthalmoscope	1
5) Water Bath	1
6) Incubator, Water Bath	1
7) Automatic Incubator, Diiator	1
8) Electronic Balance	1
9) Metabolic Shaker	1
10) Automatic Syringe	4
11) Vacuum Pump	1
	14

6. Genetics - Immunology

1) Ophthalmic Equipment	5
2) Routine Binocular Microscope	14
3) Hematocrit Centrifuge	2
4) General Centrifuge	8
5) Incubator, Low-Temperature	1
6) Incubator	1
7) Refrigerator (See-Through)	1
8) Liquid Handling System	51
9) Automatic Dilator/Dispenser	2
10) Micro Pipet	5
11) Multichannel Micro Pipet	14
12) Universal Pipeting Tool	6
13) Touch Mixer	20
14) Ice Machine, Flaked Ice	4
15) Mixer, Magnetic	20
16) Water Bath, Low-Temperature	2
17) Water Bath, Shaking	2
18) Oven	6
19) Pipet Dryer	1
20) Heating Block	20
21) Timer w/Alarm	72
22) Digital Stop Watch	72
23) Ultrasonic Cleaner	4
24) Ultrasonic Pipet Washer	2
25) Vacuum Pump	8
26) Micro Tube Mixer	6
27) Stirrer	6
28) Magnetic Stirrer	20
29) Blood Counter, Routine	54
30) Electronic Balance	26
31) pH Meter (.01)	12
32) pH Meter (.001)	2
	469

7-1) Phathology

1) Digital Dilutor/Pipeter	1
2) Laboratory Centrifuge	2
3) Hematocrit Centrifuge	2
4) Differential Leukocyte Counter	12
5) Micro Centrifuge	1
6) Phase Contrast Microscope	1
7) Binocular Reserch Microscope (Special)	1
8) Binocular Reserch Microscope	16

9) Binocular Laboratory Microscope	10
10) Digital Balance	4
11) pH Meter	2
12) Magnetic Stirrer	6
13) Touch Mixer	4
14) Micro Tube Mixer	2
15) Ultrasonic Pipet Washer	2
16) Ice Cube Machine	3
17) Timer	8
18) Small Equipment	34
19) Audio Visual Equipment	3
	114

7-13) Work Shop

1) Digital Oscilloscope	1
2) Oscilloscope, 10MHz	3
3) Digital Multimeter, 4-1/2	3
4) Digital Multimeter, 3-1/2	18
5) Soldering Station	10
6) Test Zips	1
	36

7-15) Administration

1) Photographic Equipment	2
	2

Total	86 Types	696 sets

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