

**NATIONAL PLAN FOR PREVENTION
OF VISUAL IMPAIRMENT
AND CONTROL OF BLINDNESS**



OPHTHALMOLOGY SECTION

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INDIA'S NATIONAL PLAN FOR CONTROL AND PREVENTION OF VISUAL IMPAIRMENT AND BLINDNESS

The problem of curable and incurable blindness in India is posing serious public health, social and economic problem. The main diseases, recognised as responsible for visual impairment and blindness in the country are Cataract, trachoma infection of the eye, smallpox, mal-nutrition, injuries squint and glaucoma. It has been estimated that there are about 45 million people suffering from visual impairment and over 9 million blind which includes about 5 million who can be cured by proper surgical interference. There are about 25,0,000 blind children in the country who have lost sight mostly due to nutritional deficiencies injuries and squints. It has been estimated that 14,000 pre-school children suffer from eye problems resulting from deficiency of Vitamin 'A'.

Blindness costs the Nation Rs. 50,000 million in terms of capital wastage besides loss of production of an equal amount. The economic drain on the Nation is further augmented due to social dependence of the blind persons on the community. The magnitude of the problem of visual impairment and blindness, the extent of the drain on the national economy and social dependence of blind persons on the community are causing grave concern to the Government of India.

Action taken so far :

1. In order to reduce the incidence of blindness among children due to nutritional deficiency, distribution of Vitamin 'A' as part of the family welfare and nutritional programme has already been launched. This covers about 8.7 million of the 100 million children at risk by the end of March, 1976. Ministry of Social Welfare is organising special child relief measures and launching an integrated child development programme. It will prevent 2% of the probable blind population from going blind, particularly amongst the children.
2. The Government of India launched a National Trachoma Control Programme in 1963, which is centrally sponsored. About 140 million population in 1805 Blocks/PHCs of the various States and Union Territories have already been brought under the umbrella of this scheme by the end of March, 1975. The programme has almost eliminated 5% of blindness in the population covered because in these areas blinding complications of trachoma have been eliminated.
3. **Smallpox.** The country achieved smallpox zero status in June, 1975 and this has taken care of 3% of the possible blinds.
4. In case of intra-ocular surgery including cataract, about half a million operations are being done by 100 and odd medical colleges, district hospitals, eye hospitals and eye camps. This leaves about the same number of unoperated. (total annual requirement 1 million operations).
5. About 300 eye specialists and 100 ophthalmic assistants are being trained every year in various medical colleges, district hospitals, eye hospitals and eye camps. This is woefully inadequate.

Further action required :

In order to remedy the situation, the Central Council of Health, in its meeting held in April, 1975 recommended the adoption of a national policy of evolving of a comprehensive plan of action for prevention of blindness. It recommended the following strategy :

1. Steps be taken to disseminate widely the information about eye care through all media of mass communication with particular emphasis on ocular health of children; both pre-school and school-going and all other vulnerable groups.
2. Steps be taken to orient teachers, social workers and students on the problem of eye health care including nutrition.
3. Steps be taken to augment ophthalmic services in a manner that relief can be given to the community in the shortest possible time.
4. Simultaneously establish a permanent infrastructure for community oriented eye health care.

With a view to implement the above strategy, a National Programme for Prevention of visual impairment and Control of Blindness has been formulated and will be implemented on a pilot basis during 1976-79. Initially the programme will be a centrally sponsored.

Provision of diagnostic and treatment facilities in Primary Health Centres :

At present, there are hardly any facility available in the rural taluka and even district hospitals for diagnosis and treatment. It is proposed that all the Primary Health Centres in the country should be so equipped in phases so as to (a) provide a base for ophthalmic health education in the field of eye care; (b) screening the cases requiring specialised ophthalmic care; (c) render treatment for minor ailments of the eye; and (d) provide for ophthalmic health services, particularly to the pre-school and school going children.

The doctors in Primary Health Centres will be given 4 to 6 weeks training in various medical colleges. Every PHC will be provided with an Ophthalmoscope and other essential equipments. Sufficient number of beds can be used in emergencies. It is estimated that the expenditure for equipment in the Primary Health Centre will come to about 3.30 million for 1000 centres in Vth Plan and remaining will be upgraded in VI plan.

Strengthening of District/Taluka Hospitals :

Every district and taluka hospital in the country will be strengthened to provide the ophthalmic care services. In course of time, eye department will be opened in all the hospitals and at least one ophthalmic surgeon and one or two ophthalmic assistants will be permanently posted in such hospitals which do not have them already. Government of India will provide one-time assistance for equipment at a total cost of Rs. 7.50 million during this plan period for 150 hospitals and the remaining will be taken up in subsequent plan periods.

Mobile Ophthalmic Units :

It is proposed to deploy 30 mobile ophthalmic units by the end of 5th Plan. Each mobile unit will cover about 5 districts. The main purpose of these units will be :

- i. to provide medical and surgical treatment for the prevention and control of the eye diseases.
- ii. to detect early visual defects.
- iii. to provide for general survey for prevalence of various eye diseases.
- iv. to educate people in the method of prevention of eye diseases and proper care of the eyes in order to preserve eye-sight; and
- v. to take care of the ocular health of school children specially during non-operation periods.

These mobile units will function under the control of the Regional Director of Health of the division where they are deployed and who will be responsible for holding eye relief camps in various places. Recurring and non-recurring cost on these mobile units is proposed to be met by the Central Govt. during 5th Five Year Plan. These mobile units will also observe the implementation of National Programme for Prevention of Blindness in the Primary Health Centres. It is expected that through the agencies of these mobile units, it will be possible to perform about 50,000 operations in the next three years. The cost on these mobile units during Vth Five year Plan period will be Rs. 12 million non-recurring and Rs. 7.50 million recurring i.e. a total of Rs. 19.50 million.

Upgradation of Ophthalmic Departments of medical colleges :

The State Governments will be assisted to upgrade the ophthalmic departments of various medical colleges by providing proper equipment and staff and to convert them into Community Ophthalmic care units. 50% of the cost of equipment will be met by the Government of India. The total expenditure is estimated to be of the order of about Rs. 20 million (10 million from the Govt. of India) out of which Rs. 6.50 million will be required for 13 such colleges in this plan. The operational costs will be met by the State Governments as non-plan expenditure, including staff and beds.

Regional Institutes :

It is also proposed to strengthen and equip the existing 6 Regional Institutes with technical and other services worth Rs. one million so as to convert them into Regional Institutes. The main objectives of these Institutes will be :—

- i. to evolve and demonstrate the methods of rendering a high by effective community ophthalmic services through an integrated approach of promotive, preventive, curative and rehabilitative measures with full background of socio-economic environmental and other local factors.
- ii. to provide facilities for refresher courses to practicing ophthalmologists and for the training of ancillary ophthalmic personnel in the field of community ophthalmology.
- iii. to stimulate and provide facilities for research in ophthalmology at a high level of competence.
- iv. to train ophthalmic specialists; and
- v. operate eye banks.

The operational cost will be met by the State Government as non-plan expenditure.

National Institute (Apex Organisation)

In order to provide technical leadership and undertake long term planning and evaluation of the programme, ophthalmological investigations and develop training patterns in ophthalmology, both in para-medical and ophthalmic specialists and for conducting research, it is proposed to strengthen the Dr. Rajendra Prasad Centre for Ophthalmic Sciences in the All India Institute of Medical Sciences, New Delhi. It will act as an apex organisation in referral services for the country and provide training at a very high level. It has already 120 beds which have to be augmented. The total expenditure on strengthening the Centre would be of order of about Rs. 17 million including equipment, out of which Rs. 3 million have been approved during the Vth Plan.

Central Cell:

This Cell, which will function directly under the Ministry of Health will be responsible for monitoring the implementation of the Programme.

Voluntary Organisations:

A number of voluntary organisations are already involved in eye health care. Some of them organise eye camps. It is proposed to set apart Rs. 1 million every year to be given as recurring assistance to these agencies.

Financial Implications:

Rs. 625 Lakhs were available for implementation of the programme during Vth Plan. This included internal inputs of Rs. 375 Lakhs and expected external assistance of Rs. 250 lakhs.

DANIDA has agreed to meet the entire external assistance component of the programme. According to an agreement signed on 15th January 1978, DANIDA will be giving assistance of Rs. 850 lakhs spread over in seven years from 1977 to 1984.

BROAD DETAILS
NATIONAL PLAN OF ACTION
FOR
PREVENTION OF VISUAL IMPAIRMENT AND CONTROL OF BLINDNESS

I. INTRODUCTION.

The National Plan of Action for Prevention of Visual Impairment and Control of Blindness, as a long term measure, covering a period of 20 years, has been divided into three main sectors.

1. Peripheral sector
2. Intermediate sector
3. Central Sector

I. 1. The Peripheral Sector :

Provision of mobile units and community eye health care services at the Primary Health Centres and sub-centres.

I. 2. The Intermediate Sector :

The Intermediate level of services will be provided by equipping the taluka hospitals (tehsil or sub-divisional hospitals) and the district hospitals with beds and equipments for the delivery of community eye Health care services and lending technical support to the Primary Health Centres. It is proposed to organise the services that one bed will be available for 15,000 of population in a period of twenty years, i.e., about 175 per district.

I. 3. The Central Sector :

The central level of services will be through medical colleges, State Eye Hospitals, regional institutes and the apex organisation (National Institute—Dr. Rajendra Prasad Centre for Ophthalmic Sciences). The Central sector will be utilised for developing man-power of various types and providing technical leadership including operational research. The Centre will undertake curricula framing, long term planning and evaluation, preparation of health education material, ophthalmic research and continuing education programmes.

1.4. The financial requirements of each sector in capital equipment and supplies has been assessed for the 20 year project as under :—

Peripheral sector	112 million rupees
Intermediate sector	120 million rupees
Central Sector	117 million rupees

II. Peripheral Sector

II.1. **Mobile Units :** It is proposed to deliver specialists ophthalmic care to the remotest corner through the agency of mobile units by adopting the comprehensive camp approach purely as temporary measures reaching the peak in 8 years and then as permanent infrastructure develops, to phase them out completely in 20 years. By this time, the transport provided will have outlived its utility.

The aims and objectives of these mobile comprehensive rural eye care units will be :

- i. General survey for the prevalence of various eye diseases and blindness.
- ii. Educate people in the methods of prevention of eye diseases and proper care of the eyes in order to ensure better and lasting eye sight.
- iii. Provide medical and surgical treatment for the prevention and control of eye diseases including cataract operations.
- iv. detect early visual defects and provide suitable glasses and low vision aids at the minimum cost.
- v. help in the rehabilitation of the blind in their own surroundings by training the blind the art of daily living and mobility; and give proper and suitable vocational training.

Mobile comprehensive rural eye care units will be supervised by the Chief Divisional Administrative Medical/Ophthalmic Officer. It shall have adequate staff.

The cost of equipping each mobile unit fully including the cost of vehicles shall be Rs. 4 lakhs. The list of equipment and staff is given in appendix I. The cost will be about 32 million rupees. In the year 1976-79, 30 mobile units will be established and will require 12 million rupees.

II. 2. Primary Health Centres :

It is proposed to equip all the primary health centres in the country in phases taking into account all future increases in the number of primary health centres. It is estimated that such primary health centres will rise to about 16,000. Providing equipments (list at appendix-II) at an average of Rs. 5,000 to these health centres will entail an expenditure of Rs. 80 million. In the period 1976-79, 1100 primary health centres will be so provided with equipments at cost at 3.3 million rupees.

At each of these centres, fully trained ophthalmic assistants will be provided at the cost of the State Governments.

III. Intermediate Sector :

III.1. It is proposed to provide one time assistance to all Taluka and District Hospitals where special eye care services would be created. Assuming that there are about 1600 taluka and 400 districts in the country, the assistance required for each taluka hospitals will be @Rs. 50,000 for taluka hospitals i.e. a total of Rs. 80 million in the next 20 years and that the equipment assistance required for

the district hospitals ultimately will work out to about a lakh of rupees per district hospital. There are about 400 district hospitals. The expenditure, therefore, be of the tune of Rs. 40 million. The requirement in the intermediate sector will, therefore, be 120 million rupees. During 1976-79 only 150 districts will be taken up at the cost of Rs. 7.5 million rupees.

III. 2. The purpose of these hospitals will be;

1. to impart health education, to field workers so that they may be able to carry the message of prevention of visual impairment and control of blindness as well as spread education about eye health care in the population;
2. to screen and diagnose all ophthalmic patients;
3. to participate in work of mobile units;
4. to provide leadership to PHCs and other smaller units;
5. to provide for common treatment for intra-ocular and extra-ocular diseases including surgical operations;
6. to choose proper referral;
7. to provide screening for population including pre-school children, school children and industrial workers;
8. to test and prescribe glasses for the above categories.
9. to survey local industries with a view to tender advice on safety measures for visual health.

The districts hospitals, ultimately, are proposed to be staffed with two ophthalmic assistants and two ophthalmic surgeons. The taluka hospitals will be staffed with one Ophthalmic Surgeon and one Ophthalmic Assistant. Their main aim would be to offer good ophthalmic care to the community through an integrated approach of promotion, prevention, cure and rehabilitation with an out-reach of its out-patient to the community and temporarily adoption of camp approach. The list of equipment to be provided at taluka and district hospitals is given in Appendix III and IV.

IV. Central Sector :

These services shall be provided through the medical colleges, regional institutions and the apex organisation.

IV. 1. Medical Colleges

For this purpose, medical colleges shall be upgraded, and shall be provided with equipment of 5 lakh of rupees as per list attached. (Appendix V). There are 106 medical colleges in the country and therefore, an expenditure of Rs. 5.30 lakhs will be required. The departments of ophthalmology of these colleges will be converted into departments of community ophthalmology and shall also be involved in man-power development for the needs of the community. The man power of all types of workers will be ophthalmic assistants, technicians, ophthalmic nurses, general practitioners trained in ophthalmology and specialists in ophthalmology. These medical colleges will offer good ophthalmic care to the community through an integrated approach defined above and they shall be provided with minimum of 75 beds. These medical colleges will also provide technical leadership in the district hospitals, taluka hospitals, primary health centres and smaller units. During 1976-79 only 13 Medical Colleges will be taken up at the cost of Rs. 6.5 million rupees.

IV. 2. Regional Institutes :

The second ladder of the central services shall be through the regional institutions which shall be strengthened by provision of equipment. Each (Appendix-VI) regional institute is proposed to be given equipment worth about 35 lakh of rupees during the 20 years period. The cost of these Regional Institutes will therefore be about 21 million. These Institutions will be utilised for development of specialised man-power and rendering of a highly competent ophthalmic services to the community through an integrated approach defined earlier. These should be able to demonstrate the methods of such services with a full back-ground of socio-economic, environmental and local factors. These institutions will also be utilised for continuing education programmes for general practitioners, para-medical personnels in ophthalmology and practising ophthalmologists. They will also be helpful in disseminating information with regard to recent advances in ophthalmology with an applied bias. The Regional Institutes will undertake research in Eye Bank procedures, implementation of grafts, visual research, clinical research, experimental research and environmental ophthalmic research. Each of the regional institute shall have about 250 beds, a community ophthalmology wing, including mobile unit and an eye bank, teaching and research centre including basic basic sciences and para-medical laboratories and visual sciences laboratories and it shall have a rehabilitation wing to serve as demonstration centre. The cost on equipping regional institutes during 1976-79 will be Rs. 6 million.

IV. 3. State Eye Hospitals :

Besides these regional institutes in about 15 states, their existing eye hospitals shall also be strengthened by provision of equipment to the tune of Rs. 15 lakhs per unit i.e. a total of 250 lakhs. These state eye hospitals will involve themselves into community ophthalmic services through the assistance and guidance of the regional institutes and if necessary, will be utilised for further augmenting the man-power. They will also give practical bias to the training programmes. No financial assistance is envisaged to these hospitals during 1976-79.

IV. 4. National Institute :

Finally, at the apex, there shall be an organisation which will function as a National Institute of Ophthalmology and it is envisaged that Dr. Rajendra Prasad Centre for Ophthalmic Sciences, will function as such. Main functions of this centre, besides the functions assigned to the regional institutes shall be to strengthen and promote national technical leadership by holding refresher courses for all categories of teachers and specialists in ophthalmology; it will undertake technical long-term planning and evaluation of programmes and services. This apex organisation will also undertake the planning and programming of epidemiological investigations. The Centre will lay down and develop the training pattern in community ophthalmology for under graduates and postgraduates; community education for medical and allied health personnel. The Centre will have 325-350 beds, a National Eye Bank and an Experimental Eye Research Centre, a Community Ophthalmology Wing including Mobile Units, a Visual Research Centre including facilities for research in low vision aid and contact lens, ophthalmic basic sciences research laboratories, ophthalmic para-clinical research laboratories, an instrument repair-cum development workshop, a computerised medical record section and similar other sections and organisations. It should be able to train techers in ophthalmology for various institutions

including regional institutes and medical colleges, specialists for various eye hospitals and to develop pattern for training of nurses in the care of ophthalmic patients. It shall also provide facilities for post-doctoral training and research training in ophthalmology.

It is proposed to expand the building of the centre considerably to house the services already mentioned. At present, buildings are far short of its requirements. The Centre shall also be provided with large number of equipments (Appendix-VII).

The total requirement for the National Institute shall be Rs. 250 lakhs of which Rs. 30 lakhs are required during 1976-79.

The total requirement for the Central Sector shall be near about 120 million.

V. Health Education :

Health Education shall be an important plank of this Plan and shall be an important component of all organisations envisaged under the National Plan of Action from the periphery to the Centre:

APPENDIX-I

Mobile Units

STAFF

1. Senior Surgeon	1
2. Junior Surgeon	1
3. Clerk-cum-Record Keeper	1
4. Optometerist	1
5. Health Educator	1
6. Rehabilitation Assistant	1
7. Operation Theatre Nurse	1
8. Technician	1
9. Operation Theatre Assistant	1
10. Drivers	2
11. Cleaner	1
12. Lady Health Visitors	2
13. Bearer-cum-cook	1

EQUIPMENT

1. Mobile Unit and Health Education equipments :

Costing of :	Rs. in lakhs
A. Vehicles, beds, linen, blankets and tents (for 100 patients)	3.00
B. Ophthalmic and other equipments	0.65
C. Audio-visual equipment	0.35

Detailed break-up of 'A'

1. Goods transport Truck (Diesel Operated) 1
2. Station Wagon (Mini-bus) or Jeep (Diesel operated) 1
3. Folding camp beds 120 @ Rs. 450/- each, including
mattresses
6 sheets
2 pillows
6 pillow covers

4. Blankets ordinary 225 @ Rs. 80/-
5. Blankets superior 10 @ Rs. 150/-
6. Tents 8
7. Choldaries 8
8. Durries 4
9. Linen for operation work etc.
10. Other camp furniture like tables and chairs,
table lamps, petromex etc.,

Detailed Break up of 'B'

1. Operation cum dressing tables 6
2. Stretchers 8
3. Dressing Trolleys 6
4. Surgical trays 10
5. Bowls E.I. 12
6. Sterilizer (Elect) 6
7. Sterlizer (Ordinary) 8
8. Autoclaves 2
9. Gas stoves 5
10. Petromax 5
11. Sterlizing drums 10
12. Hand slip lamp working with battery/electric 1
13. Diagnostic Trial sets 12
14. Trial frames 2
15. Vision charts and drums (distance) 3
16. Vision charts (Near) 24
17. Ophthalmic cutting and non-cutting instrument. 4-sets
18. Ophthalmoscopes 2
19. Retinoscopes 3
20. Indirect Ophthalmoscopes 1
21. Other General stores As required
22. Generator 220-250 AC/DC 25 KW

Items under Category 'C'

1. 16mm. RCA Sound Projectors complete with speakers in two sets 2
2. 15 KVA Variable Stepdown transformer for the operation of the above projectors from 230 AC to 110 AC fitted with meter etc. 1
3. Photosound portable tripod screen 1
4. Empty spools for 16 mm films with can-2 sets 400 ft. spools and steel can at Rs. 25/- each 2
5. 800 ft. spools and can @ 30/- per set 2
6. Extra projection lamps 110 V-1000 W @ 80/-each 2
7. Exciter lamps 4 VC/Amps 2

8. Photo electric Cell for the Projector	1
9. Film revinding machine for 16 mm films	1
10. Film joints 16 mm (splied)	1
11. Extra lense 16 mm 3" size	1
12. Microphone High Impedence Dynamic with 7 ft. cable	1
13. Switch board with one switch 10 amps One volt meter 0.250 volts. One lamp .25 watts-one heavy duty weather proof 100 ft. cable.	1
14. Craig editor for film editing	1
15. Tool Kits consisting of 3 screw drivers in different sizes, one insulated pliar One set Allen Keys, one trush, one set of spanner.	1
16. 230 V Ac/6 Volts battery operated power output 30 W photosound model CSC-30	1
17. Various Microphones Desk and Fort models with stand and cables	4
18. Speakers suitable for public address system and mobile cinema.	4

APPENDIX-II

List of Equipment for Primary Health Centres

i) Ophthalmoscope (Heine)	1
ii) Tonometer (Shiotz-German)	1
iii) Trial Case (II & B)	1
iv) Trial Frame (Rayner)	1
v) Test charts for near and distance	1 each
vi) Cutting instrument for surgery	2 sets
vii) Camp table	1

APPENDIX-III

List of Equipment for Taluka Hospitals

1. Vision testing drum electrically operated and revolving	1
2. Retinoscopic mirros	2
3. Trial frames	2
4. Streak retinoscopes	1
5. Trial cases	2
6. Angle Poise lamps	2
7. Ophthalmoscopes (Heins)	1
8. Reading test types	6
9. Maddox Wing	1
10. Maddox Tangent Scale	1
11. Lister's Perimeter	1

12.	Gonioscope	1
13.	Hand operating lamps	1
14.	Optician rule	1
15.	Cross Cylinder	1
16.	Slit lamp (Hag Streight) or any other	1
17.	Artificial eye set	1
18.	Condensing lens + 18 D	1
19.	Binomags	1
20.	Geneva lens measure	1
21.	Surgical instruments	two sets
22.	Tonometers (Shiotz)	2
23.	Ishihara charts	1
24.	Corneal loupes	2

APPENDIX - IV

List of Equipments for District Hospitals

Sl. No.	Details	Qty.
1.	Vision testing drum electrically operated and revolving	1+2*
2.	Retinoscopic mirrors	2+2*
3.	Streak Retinoscopes	1
4.	Trial cases	2+1*
5.	Trial Frames	2+1*
6.	Angle poise lamps	2+1*
7.	Ophthalmoscopes (Heines')	1+1*
8.	Reading test types	6
9.	Maddex Wing	1
10.	Maddex Tangent scale	1
11.	Lister's Perimeter	1
12.	Gonioscope	1
13.	Hand operating lamps	1+1*
14.	Optician Rule	1+1*
15.	Cross Cylinder	1+1*
16.	Slit lamp (Hag streit) or any other standard make	1+1*
17.	Artificial eye set	1
18.	Condensing lens + 13 D	1+2*
19.	Binomags	2+2*
20.	Geneva lens measures	1
21.	Surgical instruments (Extra-ocular cataract, glancoma Squint)	2 sets +1*
22.	Tonometers (Shiotz)	2+1*

23. Ishishara	1
24. Corneal loupes	2+2*
25. Synatophors	1*
26. Perimeter Bjerum	1*
27. Hess Screen	1*
28. Major Diathermy (Keelers)	1*

*WILL BE REQUIRED AT LATER DATE.

APPENDIX - V

Medical college

I. DIAGNOSTIC EQUIPMENT

Sl. No.	DESCRIPTION	Equipment	Total
1.	Ophthalmoscopes	6+4°	10
2.	Retinoscope Streak	6+4°	10
3.	Indirect Ophthalmoscope	1+1°	2
4.	Keratometer	1+1°	2
5.	Lensometer (Focimeter)	1+1°	2
6.	Tonometer (Focimeter)	6+4°	10
7.	Tonographer	2+1°	3
8.	Synoptophore	2+1°	3
9.	Perimeter Lister	2+2°	4
10.	Perimeter Goldman	1	1
11.	Bjerrum Screen	2	2
12.	Hess Screen	2+1°	3
13.	Trial Set	6+4°	10
14.	V.A. Drums	6+4°	10
15.	Binomags	6+4°	10
16.	Slit lamp of any standard Variety	2+1°	3
16(a)	Low Visual Aid Testing Set	1	1
17.	Pachometer (Donal and Son/Hegg Streit 900)	1+2°	3
18.	Gonioscope	4+2°	6
19.	3 Mirror C. Lens	2	2
20.	Pseudi Isochromatic Charts Ishishra or A.U. Type	2+2°	4
21.	Pantoscope	1+1°	2
22.	Visuoscope	1+1°	2
23.	Buthyscope	1+1°	2
24.	Maddex Wing	2+2°	4
25.	Tangent Scale	2+2°	4
26.	Livingston Binocular Gauge	2+2°	4
27.	Roster's near point rule	1+1°	4
28.	Treatment Rack Sterlizer	1+1°	2
29.	Operating Microscope OpMI-9 type	1°	

Sl. No.	DESCRIPTION	Equipment	Total
30.	Camera for Clinical Photography (Yashika)	1°	= 1
31.	Camera for Fundus Nikon type (Wide-angle)	1+1°	= 2
32.	E.R. G., E.O G. Machine (Minograph type)	1°	= 1
33.	Funds Camera for Eluoreacine Angiography (Zeiss or Nikon type)	1°	= 1
34.	Giant Magnet	1°	= 1
35.	Hand Magnet Set	2	= 2
36.	Photocoagulator (Zeiss)	1°	= 1
37.	Major Dithermy (Keelers)	1+1°	= 2
38.	Cry-Uni (Keeler's type)	1+1°	= 2
39.	Bray applicator	1	= 1
40.	Rust Ring Remove	1+1°	= 2
41.	Sunction Appratus	4	= 4
II. SURGICAL INSTRUMENT :			
42.	Extraocular surgery set	8+2°	= 10
43.	Cataracted Glaucoma Operation set	6+2°	= 8
44.	Detachment and Squint operation set	1+1°	= 2
45.	Keratoplasty Operation Set	1=1°	= 2
46.	Ophthalmoplasty and Orbital Surgery Set	1+1°	= 2
47.	Referigerators (Godrej)	1+1	= 2°
48.	Audio-Visual Equipment	1°	= 1°
49.	Deep Freez-20	1°	= 1°
III. LABORATORY SCIENCES :			
50.	Microscope (Binocular)	2+2°	= 4
51.(a)	Electrophoresis equipment Polyacryla-mide-paper electrophoresis	1	= 1
51.(b)	Electrophoresis equipment-paper electrophoresis	1°	= 1
52.	Referigerator	1+1°	= 2
53.	Deep Freeze-70.	1°	= 1
54.	Incubator (37.C)	1	= 1
55.	Incubator (25.C)	1	= 1
56.	Auteclave	1	= 1
57.	Rotary Microtome	1°	= 1
58.	Tripple headed microscope	1°	= 1

NOTE : Items marked with (o) are the additional items for those medical colleges which are selected for upgradation of their Ophthalmic Department.

APPENDIX - VI

Equipment for Regional Institute of Ophthalmology

S. No.	Specification	Equipment	Total
DIAGNOSIS EQUIPMENT.			
1.	Ophthalmoscopes	15+10*	25
2.	Retinoscope Streak	15+10*	25
3.	Indirect Ophthalmoscope	4+2*	6
4.	Keratometer	3+1	4
5.	Lensometer (Facimeter)	3	3
6.	Tonographer	2	2
7.	Tonometer	15+5*	20
8.	Synotophore	6+2*	8
9.	Perimeter Lister	4+2*	6
10.	Perimeter Goldman	1+1*	2
11.	Bjerrum Screen	3+1*	4
12.	Acuicampimeter (Oculue)	1	1
13.	Hess Screen	4+2*	6
14.	Less Screen	1+1*	2
15.	Trial Set	15+5*	20
16.	V.A. Drums	15+15*	30
17.	Binomags	15+5*	20
18.	Slit Lamp of any standard variety	8+4*	12
18. (a)	Low Visual Aid Testing Set	1	1
19.	Pachometer Donal & Son/Haag Streit 900	3+1*	4
20.	Gonioscope	6+2*	8
21.	3 Mirror C. Lens	4+2*	6
22.	Pseudo Isochromatic Charts Ishihara or AU Type	4+2*	6
23.	Pantoscope	2+1*	3
24.	Visuoscope	2+*	3
25.	Euthyscope	2+1*	3
26.	Projectoscope Operator system complete	1+1*	2
27.	Prism bar set	1*	1
28.	Maddox Wing	4+2*	6
29.	Tangent Scale	4+2*	6
30.	Livingston Binocular Gauge	4+2*	6
31.	Foster's near point rule	4+2*	6
32.	Tonometer Rack Sterlizer	3+1*	4
33.	Berman's Locator	1+1*	2
34.	Operating Microscope OPmi-9 type	1+1*	2
35.	Operating Microscope OPmi-7 type	1+1*	2
36.	Camera for Clinical Photography (Yashika)	1+1*	2

37.	Camera for Fundus Nikon Type (Wide Angle)	1+1*	=	2
38.	Zoom Photo Slit-lamp (Nikon type)	1+1*	=	2
39.	E.R.G., E.O.G., Machine (Mingography type)	1*	=	1
40.	Ultrasonograph A Scan B Scan (Austrian)	2*	=	2
41.	Perimeter Universalis	1*	=	1
42.	Pleoptophore	1*	=	1
43.	Refraction Unit with Phoropter etc.	1*	=	1
43. (a)	Fundus Camera for Fluorescine Angiography (Zeiss or Nikon type)	1+2*	=	3
44.	Giant Magnet	1+1	=	2
45.	Hand Magnet Set	2+1*	=	3
46.	Photocoagulator (Zeiss)	1+1*	=	2
47.	Major Dithermy (Keelers)	1+1*	=	2
48.	Ruby Laser	1*	=	1
49.	Argon Laser	1*	=	1
50.	Contact Lens Manufacturing Unit equipment	1*	=	1
51.	Spectacle Lens Manufacturing Equipment	1*	=	1
52.	Cryo-Unit (Keelr's type)	2+1*	=	3
53.	Bray applicator	1+1*	=	2
54.	Rust Ring Remover	1+1*	=	2
55.	Sunction Appratus	6	=	6
56.	Boly's appratus	2	=	2
57.	VISC appratus	1*	=	1
58.	Phacoemulsifier	1*	=	1

II. SURGICAL INSTRUMENTS

59.	Extraocular surgery set	12+3*	=	15
60.	Cataract and Glaucoma Operation set	10+2*	=	12
61.	Detachment and Squint Operation set	3	=	3
62.	Keratoplasty Operation set	3+1*	=	4
63.	Ophthalmoplasty and Orbital surgery set	3	=	3
64.	Refrigerators (Godrej)	2+2*	=	4
65.	Audio-visual equipment	1+1*	=	2
66.	Deep Freez-20.	1+1*	=	2
67.	Video tape recording equipment	1*	=	1
68.	Close circuit-T.V. attachment to (OPMIS-7) op. Microscope	1*	=	1

LABORATORY SCIENCES :

69.	Microscope (Binocular)	6	=	6
70.	Spector-phototest (UV & Visual range)	1+1*	=	2
71.(a)	Electrophoresis equipment Polya-crylamide	1+1*	=	2
71.(b)	Paper Electrophresis	2+1*	=	3

S. No.	Specification	Equipment	Total
72.	Electrophoresis equipment ; —high speed —low speed	2+1*	3
73.	Referigerated Centrifuge	1+1*	2
74.	Referigerator	6+2*	8
75.	Deep Freez-70	1+1*	2
76.	Incubator (77.C)	2+2*	4
77.	Incubator (25.C)	2+1*	3
78.	Auteclave	2+2*	4
79.	Lyphilyser	1*	1
80.	Photomycroscopic equipment (Leitz)	1	1
81.	Gross Specimen Photographic	1	1
82.	Autotechnicon	1*	1
83.	Rotary Microtome	2+1*	3
84.	Ultra-microtome and other E.M. equipment and accessories	1*	1
85.	Electron Microscope	1*	1
86.	Cyrostat Microtome	1*	1
87.	Tissue Hemoganizer	3+1*	4
88.	Ultraonic disintegrate	1*	1
89.	Rotary Microtome (Frozen section)	1	1
90.	Tripple headed microscope	1	1
91.	Projection Microscope	1*	1
92.	Hot air over 2+1*	2+1*	3
93.	PH Meter	2	2
94.	Monpan balance-Mettlars	2+1*	3
95.	Distillation equipment	3+1*	4
96.	Immunoflurocent Microscope	1	1
97.	Autanalyser for amino-acids estimation	1	1
98.	Automatic fraction collector (Preferable referegerated)	1	1
99.	Automatic tricarb liquid scintilation spectro meter systm (latest model)	1	1

NOTE : The equipment will be provided in two phases. The items marked with asterisk(*) are for the second phase.

APPENDIX - VII

Equipment for National Institute

S. No.	SPECIFICATIONS	Requirements
DIAGNOSTIC EQUIPMENT		
1.	Ophthalmoscopes	30
2.	Retinoscope streak	30
3.	Indirect Ophthalmoscope	8
4.	Keratometer	6
5.	Lensometer (Focimeter)	6
6.	Tonometer	30
7.	Tonographer	3
8.	Synoptophere	12
9.	Perimeter Lister	10
10.	Perimeter Coldman	2
11.	Bjerrun Screen	6
12.	Acuicampimeter (Oculus)	2
13.	Hess Screen	6
14.	Lees Screen	3
15.	Trial Set	30
16.	V.A. Drums	50
17.	Binomags	30
18.	Slit Lamp of any standard variety	25
19.	Low Visual aid Testing Set	2
20.	Pachometer Donal & Son/Haag Streak 900	4
21.	Coniöscope	12
22.	3 mirror C. Lens	12
23.	Pseudo Isochromatic charts Ishishara or A.U. Type	6
24.	Pantoscope	4
25.	Visulscope	4
26.	Puthyscope	4
27.	Projectoscope	4
	Optestor system complete	2
28.	Prism bar set	3
29.	Maddox Wing	8
30.	Tangent scale	8
31.	Livingston Binocular Gauge	8
32.	Fostor's near paint fule	8
33.	Tonometer Rack Storilicer	4
34.	Berman's Locator	3
35.	Operating Microscope OPmi—9 type	4
36.	OPmi—7	4

S. No.	SPECIFICATIONS	Rsquirements
37.	Camera for clinical Photography (Yashika)	2
38.	Camera for Fundus Nikon Type (Wide Angle)	2
39.	Zoom photo Slit Lamp (Nikon Type)	3
40.	E.R.G., E.O.G., Machino (Mingograph Type)	2
41.	Ultrasonograph A Scan & B Scan (Austrian)	2
42.	Porimeter Universals	1
43.	Plooptophere	1
44.	Refraction Unit with Phoropter etc.	1
45.	Fundus Camera for Fluorescine Angicgraphy Ziess or Nikon Type	2
46.	Giant Magnet	1
47.	Hand Magnet Set	2
48.	Photocoagulator (Zeiss)	1
49.	Major Diathermy (Keelers)	2
50.	Ruby Laser	1
51.	Argon Laser	1
52.	Contact Lens Manufacturing equipment	1
53.	Spectacle Lens Manufacturing Equipment	1
54.	Cryo Lathe Equipment	1
55.	Cry-Unit (Keeler's type)	4
56.	B-ray applicator	2
57.	Rust Ring Remover	2
58.	Suction appratus	8
59.	Boyles "	3
60.	VISC "	1
61.	Phacomulsifier	1

III. SURGICAL INSTRUMENTS

62:	Extraocular Surgery Set	20
63.	Cataract & Glaucoma Operation Set	15
64.	Detachment & Squint Operation Set	4
65.	Keratoplasty operation set	8
66.	Ophthalmoplasty & Orbital Surgery set	4
67.	Refrigerators (Godrej)	8
68.	Audic Visual Equipment	4
69.	Deep Freez -20°	3
70.	Video tape recording equipment	1
71.	A close circuit T.V. attachment to (OPMIs-7) op. microscoae	2

S. No.	Specifications	Requirements
III. LABORATORY SCIENCES		
72.	Microscope (Binocular)	8
73.	Spectro-photometer (UV & Visual range)	2
74.	Electrophoresis equipment :	
	(a) Polyacrylamide	2
	(b) paper electrophoresis	3
75.	Electrophoresis Equipment :	
	(a) high speed	3
	&	
	(b) low speed	1
76.	Refrigerated Centrifuge	2
77.	Refrigerator	12
78.	Deep Freeze—70°	3
79.	Incubator (37°C)	6
80.	,, (25°C)	4
81.	Autoclave	6
82.	Lymphocytometer	1
83.	Photomicroscopic equipment Leitz	2
84.	Cross Specimen Photographic	1
85.	Autotechnicon	2
86.	Rotary Microtome	3
87.	Polymeter Lab. equipment	1
88.	Ultra microtome & other E.M. Equipment & accessories	1
89.	Electron Microscope	
90.	Cryostat Microtome	2
91.	Tissue Homogeniser	4
92.	Ultrasonic disintegrator	1
93.	Projection microscope	2
94.	Rotary microtome (frozen section)	1
95.	Triple headed microscope	2
96.	Hot air oven	4
97.	PH meter	3
98.	Monopan balance-Mettlers	3
99.	Distillation equipment	4
100.	Immunofluorescent Microscope	1
101.	Autoanalyser for amino-acids estimation	1
102.	Automatic Fraction Collector (preferable refrigerated)	1
103.	Automatic tricarboxylic liquid scintillation spectrometer system (latest model)	1