OPHTHALMOLOGY

REGULATIONS & TRAINING PROGRAMME

2003
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DOCTOR OF MEDICINE IN OPHTHALMOLOGY- 2003

1. INTRODUCTION

The following is an outline of the training, assessment and examination for prospective candidates entering the training programme for Doctor of Medicine in Ophthalmology (MD) from 2003.

2. OVERVIEW OF THE TRAINING

After entering the training programme candidate goes through a structured training period of three years before being eligible for final examination. This is a time-based programme with criteria for satisfactory training built in. Assessment for training will be done regularly and necessary steps will be taken by the board to improve the standard of the trainee. The board reserves the right to modify the time periods and criteria required for satisfactory training from time to time with adequate notice. After the final examination he/she works in a senior registrar capacity for two years. Of which one year must be in an approved center abroad. Within the training period he/she is expected to conduct an approved research project and submit a dissertation. Once this is completed he/she will be board certified as a specialist.

2. ELIGIBILITY TO SIT THE MODULE I

1.1 Every applicant should have a medical degree registrable with the Sri Lanka Medical Council.

1.2 Completion of an internship recognized by the Sri Lanka Medical Council.
MODULE I (ENTRY EXAM)
The examination will test the candidates’ knowledge of General Anatomy, General Physiology, General Pathology, Microbiology, and Pharmacology

EXAM FORMAT

Theory
MCQs Total 120 - 4 hrs

Paper I
General Anatomy 30 questions
General Physiology 30 questions - 2 hrs

Paper II
General pathology 30 questions
Microbiology/ Immunology 20 questions
Pharmacology 10 questions - 2 hrs

Written paper- Structured Essay

Paper III 6 questions
General anatomy 2
General physiology 2
General pathology 1
Microbiology/ Pharmacology 1 - 3 hrs

Viva - 20 minutes each
2. ELIGIBILITY FOR ENTRY TO IN-SERVICE TRAINING PROGRAMME (ONE YEAR)

2.1 Successful completion of Module I examination or exemption from the Module I examination (granted by the board of study in ophthalmology)

During this period of one year he/she is expected to gain proficiency in examination techniques, pre and postoperative management of patients, basic surgical skills basic knowledge in clinical ophthalmology and introduction to applied basic sciences. There will be assessments by panel of examiners every four months.

REMOVAL FROM THE TRAINING PROGRAMME

The board of study may decide to terminate the training, if the trainee is not up to the expected standard in all disciplines.

MODULE II

After being in the in-service training programme for 1 year the candidate(s) is eligible to sit for Module II

EXAM FORMAT

The examination will test the knowledge of Ocular Anatomy, Ocular Physiology, introduction to Ocular Pathology, Radiology, Genetics, Epidemiology, and Statistics.
MCQ s  Paper I  2hrs  60 questions  
Structured essay  Paper II  1½ hrs  3 questions  
  Ocular Anatomy 
  Radiology, Medical 
  Genetics 

Paper III  1½ hrs  3 questions  
  Ocular Physiology, 
  Introduction to 
  ophthalmic pathology, 
  Epidemiology 
  Statistics 

Viva 
Two Viva boards  20 minutes each 
Two ophthalmologists in each panel 

MODULE III 
Six months after successful completion of Module II, the 
candidate(s) is eligible sit the Module III examination. 
During this period the trainee is expected to gain proficiency in 
theoretical and clinical aspects of Optics and refraction. 

There will be two assessments by panel of examiners before 
Module III examination. 

Their performance in both assessments should be satisfactory for 
them to be eligible to sit the examination. 

EXAM FORMAT 

Theory 
MCQ s  45 questions  1½ hrs 
Structured Essay  4 questions  2hrs 

Viva / Clinicals 
Clinical refraction test  2 cases  30 minutes 
Viva (2 Ophthalmologists)  15 minutes
MODULE IV

The examination consists of medical and surgical ophthalmology, Ophthalmology in relation to General Medicine and Neurology, Ophthalmic pathology, Basic science in relation to clinical Ophthalmology.

ELIGIBILITY TO SIT FOR MODULE IV

2 yrs after successful completion of Module II with successful completion of Module III examination.

There will be four assessments by the panel of examiners before the examination. The marks obtained from their assessments constitute $\frac{1}{8}$th of the total aggregator of the module IV examination.

EXAM FORMAT

| 100 | MCQ s | 60 questions | 2hrs |
| 100 | Structured Essay | 4 questions | 3hrs |
| 100 | Viva I | Basic sciences in relation to clinical ophthalmology | Two Ophthalmologists | 20 minutes |
| 100 | Viva II | Medical and surgical ophthalmology | External examiner | 20 minutes |
| | | | Ophthalmologist |
| 100 | Viva III | Pathology | External examiner | 20 minutes |
| | | | Pathologists |
| 100 | Clinicals in ophthalmology | 2 panels | 3 cases with each panel | 60 minutes |
| 100 | Clinicals in Neuro-ophthalmology | Panel | | 30 minutes |
| 100 | Continuous assessments | | | 5 |
SYLLABUS – MODULE I

GENERAL ANATOMY

Head, neck and specials, Central nerve system – Brain and spinal cord

- **The Brain**
  - The structure of nerve tissue – neurons, neuroglia and supporting tissue, the process of myelination
  - Topography and subdivisions of the CNS
  - Meninges, venous sinuses and communications C.S.F. formation and drainage
  - The external topography and internal structure of the cerebral hemispheres special centers, basal ganglia, ventricles, internal capsule.
  - The chroid plexus and the C.S.F. circulation
  - Projection fibers, association fibers and commissural fibers of the cerebellum
  - Brain barriers – Blood brain barrier, Blood C.S.F. barrier
  - The circum ventricular organs
  - The vasculature of the CNS, Blood supply, venous drainage of the brain specialized areas.
  - The gross topography of the diencephalons- epithalamus, thalamus hypothalamus and subthalamus
  - Pituitary- Anatomical relations development, neurophysiology, microspic structure, function, control of secretion, hypothalamo hypophysial circulation

- **Brain stem**
  - Medulla, pons and the midbrain medullary pontine junction, crus cerebellum
  - The external and internal topography of the brain stem
  - To draw and label sections of the brainstem at various levels
• **Cerebellum and its connections**
  o Deep cerebellar nuclei, functional considerations
  o All cranial nerve nuclei, positions, central connections, course both intracerebral, intracranial and their functional considerations.
  o Testing the action of all cranial nerves and CNS examination
  o Cerebral dominance
  o Pituitary gland, relations’ development, secretions and actions. Hypothalmo hypophyseal circulation.
  o The general organization of the sensory motor pathways
  o The ascending sensory pathways.
  o Motor nuclei and descending pathways

• **Spinal cord**
  o The Spinal cord & the spinal nerves
  o Spinal meninges
  o Spinal cord topography, ascending and descending tracts
  o Spinal cord levels
  o Lower motor neurons and upper motor neurons and the characteristic features of the lesions
  o The autonomic nervous system, the general arrangement
  o Reticular formation and its functional considerations
    Development of the brain and the spinal cord and embryological basis of the congenital anomalies

• **Head and Neck and Specials**
  o Bones- skull, mandible, Cervical vertebrae, Atlas, axis and the joints of the neck, movements of the neck, first thoracic vertebra, the first rib and the manubrium sterni.
  o The external and the internal appearance of the skull, the anterior, middle and posterior cranial fossae and their contents.
  o The formation in the skull, structure that pass through them, base of skull, the bones of the nasal cavity, palate and the paranasal sinuses
- Anatomy of the temporo mandibular joint
- Temporal fossa, infra temporal fossa and pterygopalatine fossa and their contents
- The cervical vertebrae, atlas, axis joints of the neck
- Skull of the new born

**Neck**
- General arrangement of the superficial and deep structures of the neck
- The facial distribution and tissue spaces in the neck
- The viscera of the neck
- Great vessels and nerves of the neck, the carotid system and the vertebrae system
- Venous drainage of the head, neck lymphatic drainage
- Arrangement of lymph nodes and lymphatic drainage of the head and neck
- The anatomy of the root of the neck
- Cervical plexus formation and distribution
- Muscles of the neck, face, innervation and actions, testing of the actions where appropriate
- The anatomy of the thymus, thyroid, parathyroid, histology and development
- All the soft tissue in the neck.. Oesophagus, trachea, pretracheal muscles, pre vertebral and postvertebral muscles.

**Face**
- Superficial and deep structures of the face
- Muscles of facial expression
- Muscles of mastication
- The nerves, arteries, veins and lymphatics of the face
- The parotid gland including its histology
- Embryology of the face and the basis for the congenital anomalies of the face
- Scalp, cutaneous innervation, arteries and veins of the scalp
General arrangement of the autonomic nervous system
Autonomic nervous system, parasympathetic and sympathetic chain and ganglia, arrangement, innervation actions and applied anatomy
Cranial autonomic ganglia, connections and relations

Specials

Anatomy of all the paranasal sinuses, including their development and applied anatomy
Anatomy of the nose, nerve supply, blood supply and development
Anatomy of the mouth, tongue, palate and pharynx, blood supply innervation development, swallowing
Anatomy of the larynx. Cartilages of the larynx, mucosa of the larynx innervation and practical applications.. speech.

Embryology
Development of the head neck pharyngeal arches
Embryological basic for the developmental defects in the head neck

Surface marking
Surface marking of important structures in the head and neck

X-Rays
Normal X-Ray CT scan and MRI of the head, neck and brain

Histology of the structures in the region

Applied anatomy of the above where ever indicated
General Physiology

- Fluid and Electrolyte balance and Osmolality
- Cardiovascular system
  - Capillary pressures, tissue fluid and oedema
  - Blood flow in the circulation
  - Heart as a pump
  - Pressure changes in the heart
  - Venous pressure
  - Cardiac output
  - Peripheral resistance
  - Regulation of arterioles
  - Arterial pulse and blood pressure
  - Regulation of blood pressure, baroreceptors, VMC, CIC
  - Reactive hyperaemia, vasodilatory nerves, axon reflex and triple response
  - Gravitational effects on the circulation
  - Rennin-angiotensin mechanism
  - Pulmonary and cerebral circulation
  - Exercise
  - Haemorrhage

- Respiratory system
  - Pulmonary ventilation
  - Diffusion of gases
  - Gas transport
  - Regulation of respiration
  - Hypoxia and the types of hypoxia
  - Cyanosis
  - Principles of oxygen therapy
  - Respiratory function tests
• Renal physiology
  o Basic principles of renal physiology
  o Renal failure
  o Renal function tests

• Hypothalamic functions, Temperature regulation and fever

• Endocrine physiology
  o Pituitary, thyroid, adrenals and endocrine pancreas

• Blood
  o Components of blood (plasma and plasma proteins, RBC, WBC, platelets) and their functions
  o Erythropoiesis, anaemia and jaundice
  o Blood groups
  o Haemostasis

• Nerve and muscles physiology
  o Action potential
  o Nerve impulse transmission
  o Neuromuscular junction
  o Muscles contraction
  o Degeneration and regeneration of nerves
  o Autonomic nerve systems
  o Neurotransmission
  o Physiology of sensory nervous system
  o Physiology of motor function
  o Physiology of pain and consciousness
  o CSF composition, formation and drainage

• Regulation of hydrogen ion balance

• Liver function tests and assessment
General Pathology

- Normal cell – cell types, structure of cells, cell membrane, cell movement, cell growth, cell adhesion, cell nucleus, RNA, DNA, cytoplasm and formed structures in the cytoplasm, cell cycle PCR reaction


- Connective tissue, its normal structure-fibroblasts, pericytes, ground substance, fibronectin and the effects of disease, excessive accumulation of ground substance, diminution in amount of ground substrate, mucopolysaccharidoses, hyalinosis, solar elastosis, Marfan’s syndrome. Basic knowledge of miscellaneous tissue degenerations mucoid, hyaline fibrinoid.

- Amyloidosis-Composition and nature of amyloid, classification of amyloidoses, diagnosis of amyloid diseases in life and causes of amyloidosis.

- Causes, changes, mediators and sequelae of acute and chronic inflammatory processes.

- Aetiology, pathogenesis, pathological effects and distribution in the body of chronic granulomatous diseases – tuberculosis, syphilis, leprosy and fungal diseases.

- Principles involved in healing of skin wounds by primary and secondary intention, fracture healing, nerve and muscle healing.
- Factors predisposing to thrombosis in different sites of the cardiovascular system, morphology, structure and fate of thrombi, different types of emboli and their effects.

- Causes and pathological changes in ischaemia and infraction in different organs- heart, kidney, lung, spleen, brain and intestine.

- Basic knowledge of diseases of infancy, childhood and old age respiratory distress syndrome in new borne, Sudden infant death syndrome, inborn error of metabolism, Haemolytic diseases of new born. Celluar ageing, osteoporosis, osteoarthritis, Parkinson’s diseases, temporal arteries.

- Pathological accumulation of calcium, melanin pigment and iron in tissues – Causative factors and effects of such abnormal accumulation.

- Disturbances in the body fluid and electrolyte balance and pathogenesis of odema, pure water deficiency, combined sodium and water deficiency, pure water excess, disturbances of potassium balance, respiratory alkalosis, acidosis. Metabolic acidosis and alkalosis.

- General reaction to trauma, haemorrhage and shock

- Causes of acute and chronic venous congestion and its pathological effects in different

- Body’s defenses against infection-sources of infection, transmission of organisms to the body, contamination, pathogenesis of infection and the body’s response to infection
• Basic knowledge of immune system, immuno pathogenesis, immunity to infection

• Pathogenesis of immunologically mediated diseases and immunodeficiency disorders

• Basic knowledge of tissue transplantation. Autograft, homograft, xenograft, allografts. Fate of allografts and rejection response.

• Infections- wound infection, hospital infection, viral infection.

• Disturbances of metabolism. Diabetic mellitus – galactosaemia, alcaptonuria, phenylketonuria, G6PD deficiency, glycogenoses, lipidoses, disturbances of purine metabolism, porphyin metabolism.

• Disturbances of nutrition- starvation, obesity, protein energy malnutrition in childhood, vitamin deficiency and trace elements, Malabsorption syndrome-causes and effects

• Disturbances of endocrine function- causes and pathological effects of hyperpituitarism, hypopituitarism. Diseases of adrenal cortex (Cushing’s syndrome, adrenal insufficiency) and its pathological, biochemical changes, diagnostic tests in investigating and treating endocrine disorders.

• Temperature regulation, fever and hypothermia basic knowledge of temperature regulating mechanism, pathogenesis of fever, pathogenesis of malignant hyperthermia. Hypothermia, body’s response to hypothermia, hypothermia in infancy, adults

• Abnormalities of cell growth – hypertrophy and hyperplasia, atrophy and aplasia, metaplasia and dysplasia
• Aetiology, pathology, classification and morphology of common benign and malignant tumours and tumour markers

• The effect of ionizing radiation- effect upon cells and tissues, total body irradiation, immediate effects, late effects, genetic effects and radiotherapy

• Lympho reticular system: spleen -splenomegaly, atrophy of spleen, hypersplenism lymph nodes- lymphadenopathy and lymphoma. Thymus – hyperplasia, hypoplasia and tumours

• Heamatopoiesis – Factors that control and regulate haematopoiesis, normal RBC, Haemoglobin, some disorders of blood red cells- Anemias, iron deficiency, sideroblastic, megaloblastic anemias, haemolytic anemias, polycythemias

• Formation of WBC, normal and variations in the white cell count, disorders of white blood cells, the leukaemias, ALL, AML, CLL, CML and myelodysplastic syndrome, multiple myeloma, myelosclerosis

• Platelet and coagulation defects- thrombocytopenia, thrombocythemia, haemorrhagic disease due to vascular damage, hereditary clotting disorders, DIC

• Blood group and blood transfusion- Blood group systems, red cell- Antibody interactions, blood grouping, anti body screening, crossmatching indications for blood transfusion, blood component therapy, adverse effects of blood transfusion
Pharmacology

Drugs acting on the autonomic nervous system
Neuro humoral transmission at Muscarine and nicotine receptors
Alpha and Beta receptors
Nor adrenaline and adrenaline

Antibiotic chemotherapeutic agents – mechanism of action, unwanted side effects.
Antiviral agents
Local anaesthetics
Teroids
Diagnostic agents
Enzyme preparations
Ocular side effects of drugs used in systemic diseases

Microbiology

Micro organisms - Bacteria, virus and fungus
Culture media
Collection and transportation of specimens
Staining techniques
Diagnostic techniques
Antibiotics sensitivity
Ocular Physiology

- Eye lids - Secretions
  Lid movements – Blinking
  Pathway – Associated movements

- Lacrimal system
  Tear film Production
  Maintenance
  Functions of tears

- Cornea
  Optical properties
  Clarity, pharmacology
  Bio chemistry
  Wound healing, vascularization

- Lens
  Composition, metabolism
  Water and electrolyte balance formation of cataract

- Pupils
  Anatomy, Physiology, Pharmacology
  Afferent and efferent papillary defects
  Anisocoreaa and light near dissociation

- Vitreous
  Structure
  Physiology-functions
  Age changes

- Intra ocular pressure
  Maintenance of IOP
• Aqueous Formation, composition
  Changes in disease

• Accommodation

• Near reflex

• Visual acuity Physiological factors
  Measurement stimuli specifications
  Factors influencing VA

• Binocular vision development
  Grades
  Depth perception-monocular, binocular

• Colour vision

• Electrical phenomenas- ERG, EOG, VEP

• E.O.M. structure
  Functions
  Pharmacology
  Physiology

• Entoptic images

• Supra nuclear control of eye movements

• Ocular circulation
  Blood ocular barrier, structure
  Control of circulation / effects of drugs on ocular blood flow

• Radiometry, physical properties of light
• The Biometry of sensory transaction in vertebrable photoreceptors
  Light and dark adaptation
  Visual pigments

• Temporal responsiveness of vision
  Critical flicher fusion frequency
  Fast and slow optic nerve fibres and optic tract fibres

• Retina pigment epithelium functions
  Generation of nerve fibres and optic tract retina

• Optic nerve
  Papillodema
  Optic atrophy
Ocular Anatomy

The anatomy of the cranial cavity, bony orbit, the paranasal sinuses, bones of the face
Development of the face, orbit and paranasal sinuses
Changes infancy and old age

The ocular appendages
The macroscopic and microscopic anatomy of the eye lids, conjunctiva and the lacrimal apparatus, including relations, the blood supply, innovation and functional / applied anatomy
Movements of the eye lids, tear secretion and drainage

The arrangement of orbital septa, fascial spaces
Anatomy of the scalp, face arterial, renous drainage, applied anatomy
Venous drainage of the orbit, cavernous sinus and other dural renous sinuses
Facial veins, venous plexuses communications and applied anatomy

The orbital and the cerebral vessels, carotid systems, anastamosis between the carotids
Extra ocular muscles, attachments relation, innervation, microscopic structure, ocular movements and development / Smooth muscles of the orbit
Testing the action of the muscles
Supra nuclear control, neural basic of eye movements

Blood supply to midbrain centers. Motility problems related to obstruction of blood supply to these centers

Nerves of the orbit, innervation, autonomic cranial ganglia….ciliary ganglia
Cranial nerves including central connections and peripheral course of 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th}, 5\textsuperscript{th}, 6\textsuperscript{th}, 7\textsuperscript{th}, 8\textsuperscript{th} nerves (all details) and clinical applications. Testing of the cranial nerves action.

The gross anatomy of the eye including its dimension, microscopic anatomy if all layers of the eye. Lens, vitreous, angle of the eye and how the structures are related to their functions, blood supply.

Venous drainage nerve supply and lymphatic drainage
Topographic anatomy, surface anatomy

Development of the eye, optic nerve lacrimal gland, developmental, anomalies

Neural basis if eye movements and generation of eye movements

The brain

The brain general external topography and internal structure

The visual pathway
Optic nerve, optic chiasms, optic tract, lacrimal geniculate nucleus...
Colliculli
Optic radiation
Thalamus- primary visual cortex, visual association areas
Topography, organization, microscopic anatomy and function of visual cortex
Occipital and frontal eye centers
Blood supply to the visual cortex and applied anatomical considerations

Circle of willis and distribution

Cerebellum – cerebellar nuclei and connections
Anatomical pathways, ascending and descending tracts
Autonomic nervous system, sympathetic and parasympathetic innervation of the eye and orbit
Lacrimal gland and related structure
Cranial autonomic ganglia and cervical sympathetic chain and distribution

UMN and LMN lesion
INTRODUCTION TO OPHTHALMIC PATHOLOGY

Biopsy of ocular tissues
   Indications for biopsy
   Type of biopsy specimens

Processing of biopsy specimens
   Fixation
Handling of biopsy specimens
Orientation of the specimen with identification of surgical margins
Routine stains
Special stains
Common immuno histochemical methods
Electron microscopy
Nuclic acid hybridization
PCR
Processing of enucleated eye
Common inflammatory diseases
Common neoplastic diseases
Medical Genetics

Basic Genetic Concepts
The trainee should demonstrate a thorough knowledge of the following:
- Chromosomes
- Mitosis and Meiosis
- Chromosome culture and karyotyping
- Nomenclature of human chromosomes
- Chromosome abnormalities
- Genes
- Single gene disorders
- Mendelian patterns of inheritance
- Multifactorial inheritance
- Non-traditional patterns of inheritance
- Polymorphisms and genetic markers, Linkage, Gene mapping

Genetic Testing
The trainee should demonstrate an awareness of the following:

- Benefits, risks and limitations of testing
- Communication, education and informed consent
- Different types of testing
  - Cytogenetics
  - Fluorescent In-Situ-Hybridization (FISH)
  - Molecular Diagnostics
  - Biochemical Diagnostics
  - Tests used in Prenatal Diagnosis
  - Perinatal pathology / Autopsy
- Different test settings
  - Carrier Screening
  - Pre-implantation Genetic Diagnosis
  - Prenatal Diagnosis
  - Newborn Screening
  - Pre-symptomatic testing for late onset disorders
Communicating test results

Clinical Genetics
The trainee should be able to:

- Take a family history, construct a pedigree and analyse it.
- Calculate genetic risks
- Provide basic genetic counseling
  (The trainee should know the basic principles, benefits and impact of genetic counseling)
- Make a referral for specialized genetic counseling/testing where indicated.
  (The trainee should be aware of the different types of genetic services and the types of services available in Sri Lanka)
- Search on-line Internet based genetic knowledge bases.

Statistics
Types of date, Measures of central tendency, Measures of variation/dispersion, Grouped date, presentation of date, probability, Distributions (normal and skewed distributions), Confidence intervals, Hypothesis testing, Standard Normal Deviate, Students t-tests, paired t-tests, chi-square test, Correlation, Regression, Sampling, Type I and Type II errors, Significance levels, p-values.

Epidemiology
Descriptive and analytic epidemiology, Measures of disease frequency, Measures of association/risk, Epidemiological Study Designs, Screening tests, evaluation of screening tests, Reliability, Validity, sensitivity, specificity, positive predictive value, negative predictive value, ethics in epidemiological studies.
SYLLABUS MODULE III

• Physical optics
  o Nature of light
  o Propagation of light
  o Wave theory
  o Nature of waves
  o Electro magnetic spectrum
  o Visible spectrum
  o Types of spectra
  o Photons
  o Interference, Coherence, Polarization, Scatter
  o Diffraction, Flourance
  o Illumination basic aspects, photometry, radiometry
  o Laser fundamentals production
  o Types of lasers used in ophthalmology

• Geometrical optics
  o Pin hole
  o Reflection at plane surface laws of reflection
  o Reflection at curved surface (spherical surface only excluding parabolic reflection)
  o Refraction at plane surface single and parallel prisms
  o Laws of refractions, refraction index
  o Concave and convex lenses
  o Lens combinations
  o Thick lenses
  o Aberration of lenses
  o Magnification – types of magnifying of lenses
  o Vergance, Vergance formula
  o Optical instruments- Telescope, Microscope
  o Properties of ultrasound
  o Puzo-electric effect
• **Clinical optics**
  - Optics of the eye
  - Schematic and reduced eye
  - Visual acuity, contrast sensitivity
  - Emetropia
  - Accommodation, Problems of defects, Presbyopia
  - A metropia details of myopia, Hypermetropia, astigmatism
  - Anisometropia, Aniseiconia, Aphakia
  - Correction of Ametropia with spectacles, intra ocular lens, contact lenses
  - Principles of refractive surgery
  - Measurement of lens power
  - Calculation of IOL power
  - Keratometer / Foci meter
  - Details of retinoscopy, Maddox rod, Stenopic Slit, Jaeksons cross cylinder
  - Auto refraction (principle)
  - Low vision aids

• **Instruments**
  - Direct and indirect ophthalmoscopy
  - Retinoscope
  - Operating microscope slit lamp
  - Optics of fundus viewing lenses
  - Ultrasound instrument – in relation to ophthalmology

• **Clinical refraction**
APPLIED BASIC SCIENCES

The candidates should be fully conversant with the structure and the functions of the normal eye, ocular adnexia, orbit and visual pathway.

Pre operative general medical and anaesthetic assessment

Operating theater practices
  Aseptic technique and sterilization
  Surgical aspect of local and general anaesthesia

Post operative systemic complications
  Infections (bacteria, virus, fungus, HIV, Hepatitis)
  Antibiotics – principle and practices
  Cortico steroids therapy
  Immuno supressive therapy
  Other pharmacological and therapeutic agents

Basic ophthalmic surgical practices
  Instruments, suture materials, suturing methods, cryotherapy, laser surgery, diathermy, ultrasonic technique

CLINICAL OPHTHALMOLOGY

Comprehensive knowledge of medical ophthalmology and ophthalmic surgery in relation to
  Cornea
  Conjunctiva
  Lens / Cataract
  Glaucoma
  Vitreous
Retina
Sclera
Extra ocular muscles
Paediatric ophthalmology and squints
Lacrimal gland
Lacrimal drainage system
Eye lids
Orbit
Relevant aspect of oculo plastic surgery

OPHTHALMOLOGY IN RELATION TO GENERAL MEDICINE AND NEUROLOGY
Candidates is required to have a more detailed knowledge of
Disorders of visual pathway
Interpretation of visual filed defects
Papillaeedema
Interpretation of relation of intra cranial disease to the eye
including raised intra cranial pressure, multiple sclerosis, tumors, head injuries
Carotid artery disease
Recognition of eye movement disorders and nystagmus
Clinical approach to headache, facial pain, other cranial nerve disorders
Pupillary abnormalities
Investigations – ERG, VEP, CT, MRI

A general appreciation of those systemic diseases which may involve the eye with particular reference to atherosclerosis, hypertention, endocrine disorders, Rheumatic disorders, vasculitis, inherited diseases
PATHOLOGY AND SURGICAL MANAGEMENT
Candidates are expected to have a detailed knowledge of the pathological conditions affecting the eye, ocular adnexia, orbit, and visual pathway.
Neoplastic, inflammatory, degenerative, vascular diseases affecting Respiratory system, Cardiovascular system, Musculo skeletal system, soft tissues giving rise to ocular complications.

GENETICS

The trainee should demonstrate awareness of the following:

- Dysmorphology / congenital abnormalities
- Inborn errors of metabolism
- Teratogenesis
- Mutagenesis
- Carcinogenesis
- DNA finger printing
- Paternity testing
- Genetherapy

Special topics in ophthalmogenetics
The trainee should acquire knowledge in the following:

- Genetics of blindness
- Genetics of in born errors of metabolism with ocular manifestations
- Chromosomal disorders with ocular manifestations
- Genetically determined disorders of the:
  - Globe
  - Anterior segment
  - Lens
Financial, Ethical, Legal and Social Issues

The trainee should demonstrate and awareness of financial, ethical, legal and social issues that are associated with clinical practice.