



SRM
UNIVERSITY
(Under section 3 of UGC Act 1956)



MS Ophthalmology

Curriculum and Syllabus 2015

Branch Code: 52

SRM Medical College Hospital & Research Centre

SRM University

SRM Nagar, Kattankulathur

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MS OPHTHALMOLOGY

1.GOAL

A postgraduate student in ophthalmic surgery at the end of 3 yr course should develop proper clinical skills and make diagnosis and correlate with the symptoms and from the history taken and also be capable to diagnose diseases in his/her specialty and manage them as effectively as possible and take decisions for the patients best interest including referral to a senior consultant if there is any difficulty

Teaching ability

The student should be able to teach MBBS students about the common ophthalmic diseases basic pathophysiologic aspect and general and basic managements

Research ability

The student must acquire knowledge about research methodology including record maintaining and to conduct proper research enquiry with proper analysis and writing reports

Team work

The student should be able to work as a team with good communication ability with the patients relatives particularly in emergency situations the student should also be able to maintain human values with ethical consent

OBJECTIVES

At the end of 3 yr PG degree course the student should develop cognitive knowledge including basic sciences the student should be an expert in clinical decision making and management .The student should be well versed in cornea and contact lens clinics, cataract surgeries, glaucoma, strabismus, orbit and oculoplasty, retina, uvea diseases diagnosis and management and be able to handle children in pediatric ophthalmology and to differentiate between neurology and neuro ophthalmic lesions. He/She should expertise in various types of keratoplasty including an eye bank

2.COURSE OVERVIEW

Duration of the Course

The period of certified study and training for the Post-Graduate MS OPHTHALMOLOGY shall be Three Academic years.(six academic terms). The academic terms shall mean six months training period.

Commencement of Academic Session

The academic session for the Post-Graduate shall commence from May /June of the Academic Year.

Date Of Examination

The students admitted up to May /June of the academic year shall be registered for that academic year and shall take up their Final Third Year regular examination in April/October of the academic year after completion of 3 years/36 months.

Number of Examinations

The University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations.

Attendance

All students joining the postgraduate training programme shall work as full time residents during the period of training, attending not less than 80% (eighty percent) of the training during each calendar year, and will be given full time responsibility, assignments and participation in all facets of the educational process.

The period of training for obtaining the degrees shall be three completed years including the period of examination.

3.COURSE AND DETAILS

First Year:-

Out Patients and casualty	- 2 months
In Patients and Operation Theater	- 6 months
Other Department Postings	- 4 months
Total	-12 months

Other department postings:-

E.N.T Department	- 15 days
Plastic Surgery	- 15 days
Neurology	- 15 days
Neuro Surgery	- 15 days
Diabetology	- 15 days
Endocrinology	- 15 days
Rheumatology	- 15 days
Facio Maxillary Department	- 15 days
To attend theatre on OT days	

Second Year:-

Cornea and Contact Lens Clinic	- 2 months
Glaucoma Clinic	- 2 months
Neuro Ophthalmology Clinic	- 1 month
Orbit and Oculoplasty Clinic	- 1 month
Strabismus and Peadiatric ophthalmology	- 1 month
Refraction	- 1 month
Retina and Uvea Clinic	- 2 months
Eye Camp and Community Ophthalmology	- 2 months
To attend theatre on OT days	

Third Year:-

In patients and Operation Theater	- 12 months
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4.DETAILS OF SYLLABUS

A. Basic Sciences - applied

Anatomy

- Anatomy of lids
- Lacrimal passage
- Extra ocular muscles
- Cornea
- Angle of anterior chamber
- Uveal tract
- Lens
- Vitreous
- Retina;
- Optic nerve and visual pathway

Developmental Anatomy of Eye

- Bony orbit, spaces of orbit and cranial fossa
- Cavernous sinuses
- Blood supply to the eye and adnexa
- Blood supply of visual pathway - circle of willis
- Cranial nerves
- Autonomous supply to the eye
- Ventricles of the brain

Physiology

- Maintenance of corneal transparency
- Lacrimal secretion and tear film layers
- Formation and circulation of intra ocular fluid
- Maintenance of intra ocular tension
- Papillary reaction and their pathway
- Papillary reflexes
- Theories of accommodation
- Accommodation - convergence relationship
- Blood aqueous barrier
- Physiology of vision
- Theories of colour vision
- Binocular vision
- Blood retinal barrier
- Electrophysiology
- Axonal transmission of impulses
- Visual perception of cerebral cortex

Biochemistry

- Carbohydrate metabolism
- Metabolic disorders of lipids
- Amino acid – normal and abnormal metabolism
- Metabolism of cornea
- Metabolism of crystalline lens
- Biochemical changes of lens leading to cataract
- Photochemistry of vision
- Structure and metabolism of vitreous

Pharmacology

- Miotics, mydriatics, cycloplegics
- Parasympatholytic drugs
- Cholinergic drugs
- Sympathomimetic drugs
- Sympatholytic drugs
- Sympatholytic drugs
- Penetration of topically applied drugs
- Teat replacement substances
- Drug penetration of blood aqueous barrier
- Principles of cortisone and ACTH therapy
- Principles of antibiotic therapy
- Fluorescein eye
- Anticoagulants
- Anti viral drugs
- Anti fungal; drugs
- Immunosuppressive drugs
- Vasodilators
- Drugs used in glaucoma
- Anti neoplastic medications
- Preanesthetic medications
- Topical anesthesia
- Local anesthesia
- Anti diabetic drugs
- Anti hypertensive drugs
- Shock therapy
- Vitreous substitutes and aqueous substitutes

Pathology

- General consideration of inflammation of eye and adnexa
- Vascular changes un age, hypertension, and diabetes
- Benign and malignant tumours of eye and adnexa
- Dystrophy and degeneration of conjunctiva, cornea and retina
- Metabolic diseases
- Fungal granuloma
- AIDS

Microbiology

- General microbiological characteristics of bacteria, viruses, fungi and parasites
- Resistance and immunity
- Antigen antibody reactions
- Toxicity and hypersensitivity reactions
- Gram positive group - staphylococci, streptococci, pneumococci, corynebacteriumdiphtheris and xerosis
- Gram negative group - neisseria, moraxella, kochs bacilli, brucella, pseudomonas
- Mycobacteria and micrococcacia
- Viruses
- Herpes zoster
- AIDS viruses
- Fungi
- Aspergillus
- Fusarium
- Candida
- Parasites
- Cysticercus
- Hydatid cyst
- Loa loa
- Microfilaria
- Intestinal nematodes

Applied optics

- Geometric and ophthalmic Optics
- Basic physical optical devices
- Ophthalmic optics
- Applied optics including optical devices

Clinical Ophthalmology

- Disorders of refraction
- Disorders of the lids
- Disorders of the lacrimal system
- Disorders of the conjunctiva
- Disorders of the sclera
- Disorders of the cornea
- Disorders of the uveal tract
- Disorders of the lens
- Disorders of the retina
- Disorders of the optic nerve and visual pathway
- Disorders of the orbit
- Glaucoma
- Neuro Ophthalmology
- Paediatric Ophthalmology
- Systemic Ophthalmology (Ocular involvement in systemic diseases)
- Immune ocular disorders
- Strabismus and amblyopia
- Recent trends in Ophthalmology
- Community Ophthalmology

II. ESSENTIAL DIAGNOSTIC SKILLS - INSTRUMENTATION

Tonometry

- ✓ Applanation
- ✓ Indentation (Commonly schiotz)

Assessment of epiphora

- ✓ Jone's dye test
- ✓ Syringing - performance and interpretation

Dry eye evaluation

- ✓ Schirmer's test
- ✓ Rose Bengal staining
- ✓ Tear meniscus evaluation

Corneal ulceration

- a) Taking a corneal scraping
- b) Inoculation into media
- c) Evaluation of Gram's stain
- d) Evaluation of KOH preparation

Direct Ophthalmology

- a) Distant direct
- b) Media assessment
- c) Use of filters provided

In Direct Ophthalmology

- a) Scleral depression
- b) Fundus drawing capability
- c) Use of filters provided

Slit lamp Examination

- a) Diffuse examination
- b) Focal examination
- c) Retroillumination – direct and indirect
- d) Sclerotic scatter
- e) Specular reflection
- f) Staining modalities and interpretation

Slit lamp Accessories

- a) Applanation tonometry – Goldman' applanation
- b) Gonioscopy-
 - ✓ single mirror gonioscope
 - ✓ grading of the angle
 - ✓ testing for occludability
 - ✓ indentation of gonioscope
- c) 3 – mirror examination of the fundus
- d) 78 – D/ 90- D/ 60 – D Examination

Colour vision evaluation

- a) Ishihara pseudoisochromatic plates

Use of Amsler's grid

- a) instructing in the use of and interpreting the chart

Keratometry

- a) Performance and interpretation of keratometry
- b) Diagnosis of situations like keratoconus
- c) Keratometry
- d)

Fundus photography and fundus fluorescein angiography (FFA, FAG)

- a) Performance of and interpretation
- b) Performance of indirect fluorescein angiography

Refraction

- a) Retinoscopy
- b) Streak retinoscopy
- c) Use of trial set
- d) Use of Jackson's cross - cylinder
- e) Subjective and objective refraction

Diagnosis and assessment of squint

- a) Ocular position and motility examination
- b) Versions, ductions and vergences
- c) Convergence facility estimation
- d) Cover/uncover/alternate cover test
- e) Use of prisms bars of free prisms in assessment of squint
- f) Use of Bagolini's striated glasses/red filters/ Maddox red
- g) Use of Worth's four dot test
- h) Use of major amblyoscope
- i) Use and interpretation of the Hess chart/ Less screen
- j) performance and interpretation of diplopia charting
- k) diagnosis of amblyopia

Exophthalmometry

- a) measurement of proptosis or exophthalmos

Use and evaluation of ophthalmic ultrasound

- a) A scan ultrasound with biometry & B scan

Interpretation of perimetry

- a) Lister's & Automated Perimetry
- b) Interpretation of commonly managed problems

Radiology

AP - 20 (Caldwell's view)

PNS (Water's view)

Lateral

Submentovertical

Optic canal views

Localisation of intra ocular and intra orbital FB's

- a) Interpretation of contrast studies
- b) Interpretation of CT scans - orbital CT Interpretation

III. OPERATING THEATRE

A. Anaesthesia

- a. Retrobulbar anesthesia
- b. Peribulbar anesthesia
- c. Facial blocks
 - 1. O' Brien
 - 2. Atkinson
 - 3. Van Lint & Modification
- d. frontal blocks
- e. infra orbital blocks
- f. blocks for sac surgery

B. Magnification

- a) Operating microscope – familiarity with use is essential

C. Lid surgery

- a) Tarsorrhaphy
- b) Ectropion and entropion procedures
- c) Lid repair following trauma epilation
- d) Ptosis correction

D. Destructive procedures

- a) Evisceration with or without implant
- b) Enucleation with or without implant
- c) Exenteration

E. Sac surgery

- a) Dacryocystectomy
- b) Dacrocystorhinostomy
- c) Probing for congenital obstruction of nasolacrimal duct

F. Extraocular muscle surgery

- a) Recession and resection procedures of the horizontal recti
- b) Vertical & oblique muscle surgery

G. Cataract Surgery

- a) Standard ECCE with or without IOL implantation
- b) Small incision ECCE with or without IOL implantation
- c) Secondary AC or PC IOL implantation
- d) Vectis extraction
- e) Phacoemulsification

H. Orbit surgery

- a) Incision and drainage via anterior orbitotomy for abscess

I. Vitrectomy

- a) Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.
- b) Needs to know the basis of open sky vitrectomy (anterior segment) as management of cataract surgery complication

J. Keratoplasty

- a) Assisting penetrating keratoplasty (therapeutic, optical)

K. Glaucoma surgery

- a) Trabeculectomy
- b) Pharmacological modifications of traneculectomy
- c) Cyclocryotherapy

L. Surface ocular procedures

- a) Pterygium excision with modification
- b) Conjunctival graftings
- c)

IV. OUT PATIENT PROCEDURES

- a) Manual diagnostic procedure such as syringing, corneal scraping, conjunctival swab collection, scraping etc.
- b) Conjunctival and corneal foreign body removal on the slit lamp
- c) Chalazion incision and curettage
- d) Pterygium excision
- e) Biopsy of small lid and tumours
- f) Suture removal - skin, conjunctival, corneal and corneoscleral
- g) Tarsorrhaphy
- h) Subconjunctival injection
- i) Retrobulbar, parabolbar anesthesia
- j) Posterior sub - Tenon's injection
- k) Artificial eye fitting

V. ESSENTIAL RESEARCH SKILLS

Basic statistical knowledge

- a) Ability to undertake clinical and basic research
- b) Descriptive and inferential status
- c) Ability to publish result of one's work

Ability to constructively criticize publications in the field

This could be achieved during the course by attending workshops on research methodology, basic statistics classes and regularly having journal clubs ste., where selected articles would be taken and evaluated for content quality and presentation.

VI. OTHER SKILLS REQUIRED

- 1) Contact lenses
 - a) Assessment
 - b) RGP fitting
 - c) Soft lens fitting
 - d) Troubleshooting & Management

- 2) Subjective correction of refraction
 - a) Techniques of subjective correction
 - b) Knowledge of basic optical devices available and relative advantages and disadvantages of each

- 3) Low vision aids
 - a) The basics of fitting with knowledge of availability and cost

- 4) Community ophthalmology
 - a) Ability to organize institutional screening
 - b) Ability to organize peripheral eye screening camps
 - c) Knowledge and ability to execute guidelines of National Programme for prevention of blindness

- 5) Presentation
 - a) Ability to present one's work effectively particularly free papers in scientific conferences without allotted framework of time.

- 6) Organization
 - a) Ability to organize meetings, seminars and symposia
 - b) Ability to get along with colleagues and work as a team with the other members of the department
 - c) Ability to interest with and work as a team with other disciplines that may exist in the Hospital

- 7) Communication skills
 - a) With patients
 - b) With colleagues

- 8) Record keeping
 - a) Ability to maintain records as scientifically as possible
 - b) Knowledge of computer software is helpful

- 9) Teaching
 - a) Ability to pass on skills acquired to one's junior, the theoretical, procedure and surgical
- 10) Academic activities
- 11) Year - wise structured training schedules

TEACHING SCHEDULE

Every day

8:15-9:15am	Case presentation Journal club Seminars
9:15-1:00pm	Outpatient Operation theatre by rotation
2:00-4:00pm	Theory classes

5. MAINTENANCE OF LOGBOOK

Every Post Graduate student shall maintain a record of skills He/She has acquired during the three years training period certified by the various Head of departments where he/she has undergone training including outside the institution as follows

- 1) Specialty postings details
- 2) Special clinics
- 3) Consolidated - procedures
- 4) Journal club
- 5) Clinical discussions
- 6) Eye camp
- 7) ECCE with IOL
- 8) SICS with IOL
- 9) Phacoemulsification
- 10) Other operation
- 11) Minor procedures

12)Refraction

13)Conferences/workshops

14)Scientific papers presented

15)Papers presented journals publications-National /International

The Head of the Department should scrutinize the log book every three months and certify the work done.

At the end of the course the student should summarise the contents and get the log book certified by the Head of the Department and submit the log book at the time of the University Practical Examination for the scrutiny of the board of examiners.

5.1 It is preferable that a post graduate student during the course to present one poster presentation and /or to read one paper at a national /state conference and /or to present one research paper which can be published/accepted for publication/sent for publication during the period of his/her postgraduate studies.

6. THESIS

Every student registered as post graduate shall carry out work on an assigned research project under the guidance of a recognized post graduate teacher, the result of which shall be written up and submitted in the form of a thesis.

Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the theoretical and clinical / practical examination.

The thesis shall be a bound volume of a minimum of 50 pages and not exceeding 75 pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexure and bibliography.

Thesis should consist of

- (a) Introduction
- (b) Review of literature
- (c) Aims and objectives
- (d) Material and methods
- (e) Result
- (f) Discussion
- (g) Summary and conclusion
- (h) Tables
- (i) Annexure
- (j) Bibliography

Four copies of thesis shall be submitted six months prior to the commencement of the theory examinations on the date prescribed by the Controller of Examinations of this University. The thesis should be approved by the Professor of that branch and the same has to be forwarded to the Controller of Examinations, by the head of the department through the Dean of the college.

Two copies in addition are to be submitted as an electronic version of the entire thesis in a standard C.D. format by mentioning the details and technicalities used in the C.D. format.

The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and clinical; and on the acceptance of the thesis by two examiners, the student shall be allowed to appear for the final examination.

EVALUATION OF THESIS :

ACCEPTED / NOT ACCEPTED

No marks will be given

7. SCHEME OF EXAMINATION
UNIVERSITY EXAMINATION PATTERN

A) Marks distribution

At the end of third Year

Theory	Title	Duration	Maximum Marks
Paper - 1	Applied Basic sciences in Ophthalmology	3hrs	100
Paper - 2	Ophthalmology including community ophthalmology and refraction	3 hrs	100
Paper - 3	Ophthalmology including Neuro ophthalmology	3 hrs	100
Paper - 4	Ophthalmology including Investigative ophthalmology, Surgery and recent advances	3 hrs	100
		Total	400

Marks Allotment Guide Lines for Theory Papers

Paper - I Applied Basic Sciences in Ophthalmology - Marks - 100

There will be 20 short notes questions each carrying five marks

The division of questions and choices are as follows

1) Anatomy	-4	4 x 5 = 20
2) Physiology	- 4	4 x 5 = 20
3) Biochemistry	- 3	3 x 5 = 15
4) Microbiology	- 3	3 x 5 = 15
5) Pharmacology	- 3	3 x 5 = 15
6) Pathology	- 3	3 x 5 = 15

	Total	100

Paper - II, III, IV Theory Papers

The Division of marks allotment in each paper will be as follows

- | | |
|--------------------|---------------|
| 1) Two essays | - 2 x 20 = 40 |
| 2) Ten Short Notes | - 10 x 6 = 60 |

Total	----- 100 -----
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Theory Total: 4 x 100 = 400

CLINICAL EXAMINATIONS

<u>Clinical Examination</u>	<u>No of Cases</u>	<u>Duration</u>	<u>Marks</u>
1. Long Case	one	45 min	80
2. Short Cases	Two	15 min	80
3. Retinoscopy	one	30 min	20
4. Fundoscopy	two	30 min	20
		Total	----- 200

Oral and Viva: -

Marks

Slides/ Specimens/ X - Rays

(1) (1) (1)

FFA, Field, Scan, Charts, Instruments
(Any Two)

5 x 10 = 50

Oral

50

Total

100

Practical/Clinical and viva total: 300

MARKS QUALIFYING FOR A PASS

MARKS QUALIFYING FOR A PASS	MAXIMUM MARKS	QUALIFYING FOR A PASS 50% MARKS
Theory Examination	400	200
Practical Including clinical and Viva voce examination	300	150

A student shall secure not less than 50% marks in each head of passing, which shall include 1.Theory 2.Practical including clinical and viva voce examination.

* “The postgraduate medical students are required to pass theory and practical examinations separately. An examinee should obtain minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers for Degree examination to be cleared as “Passed” at the said Degree examination”

**As per Medical Council of India notification date 03.09.2014 and the same approved in the 28th Academic council meet of SRM University held on 23/03/2015.*

8. EXAMINATION AND EVALUATION

(1) EXAMINERS

(a) All the Post Graduate Examiners shall be recognised Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned.

(b) For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, who shall be invited from other recognised universities from outside the State and other two will be internal examiners for M.S.

(c) Under exceptional circumstances, examinations may be held with 3 (three) examiners provided two of them are external and Medical Council of India is intimated the justification of such action prior to publication of result for approval. Under no circumstances, result shall be published in such cases without the approval of Medical Council of India.

(d) The guidelines regarding appointment of examiners are as follows;-

1. No person shall be appointed as an examiner in any subject unless he/she fulfills the minimum requirements for recognition as a Post Graduate teacher as laid down by the Medical Council of India and has teaching experience of 8 (Eight) years as a Lecturer / Assistant Professor out of which he has not less than 5 (Five) years teaching experience after obtaining Post Graduate degree. For external examiners, he should have minimum three years experience of examinership for Post Graduate diploma in the concerned subject. Out of internal examiners, one examiner shall be a Professor and Head of Department or Professor.
2. There shall be at least four examiners in each subject at an examination out of which at least 50% (Fifty percent) shall be external examiners. The external examiner who fulfils the condition laid down in clause - 1 above shall ordinarily be invited from another recognised university, from outside the State: provided that in exceptional circumstances examinations may be held with 3 (three) examiners if two of them are external and Medical council of India is intimated with the justification of such examination and the result shall be published in such a case with the approval of Medical council of India.
3. An external examiner may be ordinarily been appointed for not more than three years consecutively. Thereafter he may be reappointed after an interval of two years.
4. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
5. The same set of examiners shall ordinarily be responsible for the written, practical or part of examination.
6. There shall be a Chairman of the Board of paper - setters who shall be an external examiner and shall moderate the question papers.
7. The Head of the Department of the institution concerned shall ordinarily be one of the internal examiners and second internal examiner shall rotate after every two year.

(2) Number of candidates

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed six for M.S. degree examination.

3) Number of examinations

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations.

(4) Master of Surgery (M.S.) Ophthalmology

M.S. examination shall consist of Thesis, Theory Papers, and clinical/Practical and Oral examinations.

(a) Thesis

Every candidate shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis.

Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the theoretical and clinical / practical examination.

The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical; and on the acceptance of the thesis by two examiners, the candidate shall appear for the final examination.

(b) Theory

(i) There shall be four theory papers.

(ii) Out of these one shall be of Basic Medical Sciences and one shall be of recent advances.

(iii) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the start of the Clinical/Practical and Oral examination.

(c) Clinical / Practical and Oral

(i) Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking

independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.

(ii) The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the speciality, which form a part of the examination.

A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination.

Evaluation of Answer Scripts

The answer books will be valued by two examiners. One of the two examiners will be from this university and the other will be from any other university. The Average of the two marks secured by the candidate will be taken into account. If the difference between two marks exceeds 20%, the answer scripts shall be valued by the third examiner. The average of the nearest two marks shall be considered as the final mark.

9. MODEL QUESTION PAPER

MS Ophthalmology

Paper - I

Applied basic sciences in ophthalmology

Duration 3hrs

Maximum marks -100

Answer all questions

Anatomy

4x5=20

- 1) Anatomy of cavernous sinus
- 2) Development of human lens
- 3) Angle of anterior chamber
- 4) Visual pathway

Physiology

4x5=20

- 1) Theories of colour vision
- 2) Dynamics of aqueous formation
- 3) ERG
- 4) Tear film

Biochemistry

3x5=15

- 1) Metabolism of crystalline lens
- 2) Photochemistry of vision
- 3) Metabolic disorders of lipids

Microbiology

3x5=15

- 1) Antigen antibody reaction
- 2) Pneumococcus
- 3) Adenovirus

Pharmacology

3x5=15

- 1) Cycloplegics
- 2) Fluorescence dye
- 3) Anti-viral drugs

Pathology

3x5=15

- 1) Pathology of sympathetic ophthalmia
- 2) Concretions
- 3) Corneal stromal dystrophy

MS Ophthalmology**Paper -II**

Ophthalmology including community ophthalmology and refraction

Duration 3hrs

Maximum marks 100

Answer all questions**(2x20=40)**

- 1) How do you plan a school survey? what is the importance of such survey? Give a scheme to your state?
- 2) Describe with a diagram the theory & principles of retinoscopy & describe how to prescribe glasses after the test?

Write short answers**(10 x6=60)**

1. Roscea keratitis
2. Ectopialentis
3. Low tension glaucoma
4. Ophthalmology ethics
5. Pars planitis
6. Binocular vision
7. Opto-kinetic nystagmus
8. Amblyopia
9. Armd
10. Industrial blindness

MS Ophthalmology
Paper- III
Ophthalmology including Neuroophthalmology

Duration 3hrs

Maximum marks 100

Answer all questions

(2x20=40)

- 1) Describe the maculopathy in diabetes patient? Discuss its management?
- 2) What is the mechanism of action of various drugs used to lower IOP?

Write short answers

(10x6=60)

1. Antifungal drugs
2. Superior oblique sheath syndrome
3. Histology of retinoblastoma
4. Ocular manifestations of cavernous sinus thrombosis
5. Tumours of optic nerve
6. Malignant glaucoma
7. Toxic amblyopia
8. Vitreous replacement substitutes
9. Paralytic squint
10. Wernicke's hemianopic pupil

MS Ophthalmology

Paper IV

Ophthalmology including investigative ophthalmology, surgery and recent advances

Duration 3 hrs

Maximum marks 100

Answer all questions

(2x20=40)

- 1) Describe the surgical steps and complications of phacoemulsification?
Add a note on phakic IOL

- 2) Describe the role of immunosuppressives in the management of
Ophthalmic cases

Write short answers

(10x6=60)

1. Ocular surface squamous neoplasms
2. Polymerase chain reaction
3. Scanning laser polarimeter
4. Anti vegf
5. Macula on retinal detachment
6. Visual rehabilitation
7. Evisceration
8. Impressive cytology
9. Plaque therapy
10. Operating microscope

10.RECOMMENDED TEXTBOOKS AND JOURNALS

Text Books

1. Modern ophthalmology – Dutta .Vol I, II, III 3rd Edition Jaypee, 2005.
2. Clinical Ophthalmology A Systematic approach - Kanski Jack J. 7th Edition Elsevier, 2011.
3. American Academy of Ophthalmology – AAO. Vol 1 to 13 AAO, 2009.
4. Practice of Refraction - Duke Elder. 10th Edition Butterworth heingmann, 2005.
5. Clinical optics – AAO. Section 3 AAO, 2009.
6. Parson’s Disease of the Eye – SihotaTandon. 22nd Edition Elsevier, 2015.
7. Technique of cataract Surgery - SachdevManipal.S. 1st Edition Jaypee, 2007.
8. Anatomy of eye – Snell. 2nd Edition Blackwell, 1998.
9. Physiology of Eye – Adler. 11th Edition Saunders, 2011.
10. Basic Sciences in Ophthalmology – Ferris. 1st Edition Jaypee, 2009.
11. Strabismus - Pradeep Sharma. 2nd Edition Cbs, 2012.
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*Success is more permanent when you
Achieve it without destroying good principles in life
- Walter C*

