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HEMWATI NANDAN BAHUGUNA UTTARAKHAND MEDICAL EDUCATION UNIVERSITY

REGULATIONS & SYLLABUS FOR
B.Sc Optometry
(W.e.f. Academic Session 2016-17)

1. **Bachelor in Optometry (B.Sc Optometry)**

Optometry is health care profession which deals with the examination, diagnosis treatment and management of diseases and disorders of the visual system. It is a vision care science. One can also define is as the science of eye equipment (including lenses and spectacles) which is imbued with the idea of improving the vision of the human eye and remove all kinds of obstacles of sight which an individual may experience. Optometrists work in high street practice or hospital eye clinics, where they prescribe and dispense spectacles and contact lenses, and low vision aids; and increasingly work alongside ophthalmologists to monitor the treatment of ocular disease.

This is dynamic and challenging career, which allows one to help people, achieve personal growth, community respect, job flexibility and financial success and offers virtually unlimited opportunities.

The Program is envisaged to develop a multipurpose ophthalmic manpower at Paramedical level. The training will enable a student to become a competent person in providing service as an Optician, Optometrist, Refractionist, and Ophthalmic Assistant to the community in urban, semi-urban and rural settings in Private, semi-Governmental and Governmental Sectors.

Facilities

- Extensive teaching and laboratories with attractive clinical areas.
- These state –of the- art labs provide excellent hands on training to students.
- Excellent workplace in hospital with input of large number of patients in OPD and IPD

CONTENTS
B Sc (Optometry)

MAIN OBJECTIVES OF THE COURSE

Basic Medical Sciences

1. To achieve general understanding of the Human Biology (Anatomy, Physiology, and Biochemistry).
2. To achieve good understanding of the basic medical sciences as related to Ophthalmology (Anatomy, Physiology, Optics, Pharmacology and Microbiology).

Clinical

The objective of the clinical work are to enable a student to work under the supervision of an Ophthalmologist so as to render assistance, develop skills and to perform other optometric jobs.

1. Be able to develop skills to carryout Ophthalmic investigations.
2. Be able to do refraction work including prescription of glasses, contact lenses, low vision aids.
3. Be able to assess disorder of Ocular motility and uniocular and binocular visual functions and knowledge of principles of non-surgical therapy and indications of surgery.
4. To impart knowledge with regard to common eye diseases with a view to acquaint them in their recognition.
5. To impart training to develop skill in manufacturing of spectacle lenses and contact lenses.
6. To impart knowledge regarding organizations of eye banks and preservation of ocular tissues.
7. To impart knowledge regarding importance and the methodology of conducting surveys for early detection of visual defects, prevalence of ocular diseases and organization of community services like eye camps, schools, clinics and community eye care programme.
8. To impart knowledge regarding the programme of blindness, its causes and principles of rehabilitation of the blind.

COURSE STRUCTURE

This course shall be for a period of three academic years and commencing from 1st August. Each year is divided into two semesters. There is no session vacation.

The admission for this course shall be:

1. Candidates who have secured at least 50% of marks or Grade-III in class 12 or equivalent examination in Science. Subjects (Physics, Chemistry, Biology & Mathematics)
2. Admission shall be held in July each year.

Academic Time

Monday to Friday -9:00AM to 4:00 PM

Academic time is devoted to

1. Theory classes
2. Lecture demonstrations
3. Seminars/Group discussion
4. Practical works in OPD (out patient department), various laboratories, clinics, and ophthalmic Investigative labs and community work.

First Year

Thirty-six theory lectures per month (each one hour) and two seminars in a month (each two hours)
Total theory time per month: 10 hrs/week
Practical postings: 26 hrs/week
Total academic time per month: 36 hrs/week

Second Year

Thirty six theory lectures per month (each one hour) and two seminars in a month (each two hours)
Total theory time per month: 10 hrs/week
Practical postings: 26 hrs/week
Total academic time per month: 36 hrs/week

Third Year

Eighteen theory lectures per month (each one & half hour) and two seminars in a month (each two hours)
Total theory time per month: 8 hrs/week
Practical Postings: 28 hrs/week.

Training period & time distribution:

1. Total duration of the course will be 4 years. The students shall undergo a period of certified extending over three years comprising of one year of clinical training (Internship). from the day of commencement of his study of B.Sc optometry. Each academic year shall consist of 180 days. Each semester shall consist of 90 days teaching of 8 hours each working day, including one hour of lunch break.

Attendance: 80% attendance (theory and practical individually) is mandatory appear in the sessional examination and the university examinations.

Medium of instructions: English, throughout the course studies

Rules of Examination

1. The student will not be allowed to appear in the examination unless he/she attended 80% of the total lectures, demonstration, practical and posting in the each subject separately.
2. Date of examination and appointment of examiners will be made by the Dean.
3. In the theory examination essay or multiple choice /objective type questions will be included at the discretion of the examiner. 50% of marks will be assigned for internal assessment.
4. The marks of the theory of internal assessment and final examination will be added and to considered theory marks. Similarly, the mark obtained in practical of internal assessment will be added to the practical marks of the final examination.
5. A student will be deemed to have passed in the subject if he/she obtains a minimum of 50% marks in that subject in the theory and practical separately.
6. A student will be deemed to have passed in the examination if he/she passed in each subject separately.
7. The students, who will absent himself /herself from the examination without prior permission of the Dean, will be deemed to have failed in that examination.
8. There will be no internal assessment and compulsory attendance for the student for the examination in which he/she has failed at the time of subsequent examination in that subject.
9. A candidate who will obtain 80% or more marks of the total marks in any subject shall be declared to have obtained distinction in that subject provided he/she passed in all the subjects of the course in all the phases, in the first attempt.
10. There will be two internal examiners.
11. The candidate who shall pass in one or more papers will be given exemption in those subjects. After that he/she will be given two chances at six months interval to pass in all the subjects. If he/she fails to pass in the subjects in these two extra attempts, he/she will be expelled from the course.
12. The candidate will be required to pass in the subjects of first year at least six months before the final examination of second year.
13. A second year candidate who fails in more than one subject will not be promoted to third year.
14. For the third year candidate. the examination will be taken by both internal & external examiners. There will be two examiners- one internal and one external.
15. The third year candidate who passes in one or more subjects will be given exemption in that subject. After that he/she will be given three more chances at six months interval to pass in all the subjects. However, if he/she fails to pass in all subjects, in these three extra attempts, he/she will be required to reappear the whole examination.
16. The candidate will be required to pass in all the subjects at least six months before he/she shall be allowed to appear for the final examination of third year.

GENERAL LECTURES FOR ALL STUDENTS (1ST, 2ND & 3RD YEAR)

1. Hospital environment and role of student.
2. The profession & Ethics.
3. Communication with the patients.
4. Statistics and its importance.
5. Social welfare of eye patients.
6. Law and the Optometry.

THEORY SUBJECT FOR FIRST YEAR

1. HUMAN ANATOMY & PHYSIOLOGY

1. Introduction of human body, cell and various tissue of the body.
2. Embryology and development.
3. Skeletal system of Human body
4. Muscles of the body
5. Circulatory system
6. The Blood
7. The main arteries and veins of the body & lymphatic system
8. Digestive system
9. The liver
10. The Gall bladder, Pancreas & Spleen
11. Respiratory system
12. Endocrine Organs
13. Excretory System
14. Reproductive system
15. Central Nervous System
16. Brain & Cranial Nerves
17. Spinal Cord and Peripheral nerves
18. Automatic nervous system
19. The Food, Vitamins & Protein

2. OCULAR ANATOMY

1. Embryology of the eye in general
2. Orbit and its immediate relations
3. Lids and eye lid glands
4. Conjunctiva, cornea and selera
5. Iris and cilliary body
6. Lens and Vitreous
7. Retina & Choroid
8. Ocular Muscles
9. Visual Pathways
10. Sympathetic and Parasympathetic's system
11. Vascular supply of eye
12. Lacrimal apparatus
13. Higher visual centres

3. OCULAR PATHOLOGY

1. HAEMATOLOGY

1.1 Blood Cells and blood collection techniques
1.2 Haemoglobin estimation
1.3 Total leucocyte count
1.4 Differential leucocyte count
1.5 Erythrocyte sedimentation rate
1.6 Pheripheral blood film-staining, significance of a peripheral smear
1.7 Bleeding time, clothing time

2. CLINICAL PATHOLOGY

2.1 Urine Collection methods
2.2 Physical Examination of Urine
2.3 Chemical Examination of Urine
2.4 Microscopic Examination of Urine

3. HISTOPATHOLOGY

3.1 Grossing of tissue
3.2 Tissue processing
3.3 Section cutting
3.4 Staining-Hematoxylin & Cosin and Special Stains

4. OCULAR MICROBIOLOGY

1. Introduction to Microbiology & classification
2. Gram Positive Bacteria
3. Gram Negative Bacteria
4. Fungi-Sephorophytics and pathogenic
5. Virus
6. Aseptic Techniques
7. Chlayadia & Parasites.

5. OCULAR PHYSIOLOGY

1. General Physiology of the eye – An Introduction
2. Maintenance of Transparency of the Cornea
3. Maintenance of Transparency of the Lens
4. Visual Acuity and form Sense
5. Pupillary reflexes
6. Accommodation
7. Convergence
8. Intra Ocular Pressure
9. Night Vision
10. Colour Vision
11. Visual Fields
12. Extrinsic Muscles, Actions and Ocular Movements
13. Higher Visual Centres and righting reflexes
14. Electrophysiological Aspects
15. Conjugate and disguate – Movement of the eye.

6. OCULAR BIOCHEMISTRY

1. Introduction to various biochemical test
2. General Introduction to metabolic processes affecting the eye
3. Rhodopsin Cycle
4. Aqueous and vitreous humours
5. Metabolism of lens and cornea.

7. PHYSICAL AND PHYSIOLOGICAL OPTICS

1. Elementary basis of light-Interference, diffraction, polarization spectrum, surface tension, viscosity
2. Principles of Refraction.
3. Physical Optics-1, Lens Shapes-Convex, Concave
4. Physical Optics-2, Thin Lens equation, thick lens equation
5. Physical Optics-3, Front and back vertex power
6. Physical Optics-4, Aberrations
7. Physical Optics, Spherical, Cylindrical & Toric surfaces, Aspheric surfaces
8. Prisms-definition, uses nomenclature, apex
9. Determination of focal length & diopteric power of lens
10. Strum's Conoid
11. Neutralization of lenses
12. Focimeter
13. Centre & axis Marking by focimeter
14. Simple & Toric transposition

15. Prismatic effect & Decentration
16. Abberations & Tints in spectacle Lenses
17. Spectacle Lens Manufacturing – Sphericals, Toric, Biofocals, Lenticulture & Lab Visit
18. Spectacle Frames –History, Nomenclature, Types & parts, sides, joints, frame bridge.
19. Shape of Spectacle Frame –Measurements & Making, Frame & Face Measurements
20. Schematic eye
21. Emmetropia & Ammetropia – Aetiology, Population, Distribution, Growth of eye
22. Myopia
23. Hypermetropia
24. Astigmatism
25. Aphakia/Pseudo-Phakia

PRACTICAL SUBJECT FOR FIRST YEAR

1. HUMAN ANATOMY & PHYSIOLOGY

1. Introduction of human body, cell and various tissue of the body.
2. Embryology and development.
3. Skeletal system of Human body
4. Muscles of the body
5. Circulatory system
6. The Blood
7. The main arteries and veins of the body & lymphatic system
8. Digestive system
9. The liver
10. The Gall bladder, Pancreas & Spleen
11. Respiratory system
12. Endocrine Organs
13. Excretory System
14. Reproductive system
15. Central Nervous System
16. Brain & Cranial Nerves
17. Spinal Cord and Peripheral nerves
18. Automatic nervous system
19. The Food, Vitamins & Protein
20. Organs of Taste and smell

1. OCULAR PATHOLOGY

1. Sampling and Collection of Blood: intro-venous and peripheral
2. Estimation of haemoglobin
3. Peripheral Blood Film Staining
4. Identification of normal white blood cells
5. Erythrocyte sedimentation rate
6. Urine chemical examination – Sugar and Protein

2. OCULAR MICROBIOLOGY

1. Introduction to Microbiology: Culture media, Classification, Morphological, Lab diagnosis of infection.
2. Collection of Samples
3. Serology
4. Culture media for bacteria, fungi and viruses
5. Oxidase test
6. Mantoux test
7. Staining procedures: Gram Staining
8. Staining procedures: Romanowsky stains
9. Staining Procedures: Ziehl Neelsen's staining

3. ORTHOPTICS

1. Latent squint work-up
2. Synptophore
3. Maddox wings
4. Maddox bar
5. Prism bar
6. Near point of accommodation
7. Near point of convergence
8. Fusion exercises

THEORY SUBJECT FOR SECOND YEAR

1. OCULAR PHARMACY AND PHARMACOLOGY.

1. Ocular Pharmacology – An Introduction
2. Autonomic nervous system
3. Routes of drug administration
4. Mioties, Mydriatics & Cycloplegics drugs
5. Antibacterial drugs & therapy
6. Antifungal drugs & therapy
7. Anti-Viral drugs & therapy
8. Antibacterial drugs & Therapy
9. Anti-inflammatory drugs & therapy
10. Anti-glaucoma drugs & therapy
11. Ophthalmic dyes
12. Local Anaesthetics
13. Ophthalmic preservatives
14. Ocular lubricants
15. Ocular irrigating solutions
16. Ocular antiseptic & disinfectants
17. Contacts lens solution
18. Chelating agents
19. Immunosuppressive agents

2. REFRACTION

1. Emmetropia & Ammetropia –Aetiology, Population. Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. Presbiopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of Irregular reflex
10. Accommodation & Convergence – 1. Far Point, Near Point, ranges, Amplitude of accommodation
11. Accommodation & Convergence – 2. Methods of measurements, NPA. AC/A ratio.
12. Retinoscopy –Principle & Method
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder

3. INVESTIGATIVE OPHTHALMOLOGY

ORTHOPTICS

1. Orthoptics-General Concept
2. Ocular Muscles and movements
3. AC/A ratio
4. Measurements of angle of squint
5. Latent squint
6. Maddox rod
7. Maddox Wing
8. Synoptophore
9. Manifest concomitant
10. Paralytic Squint
11. Head Posture and its significance

12. Hess Screening and its Interpretations
13. Pleoptics
14. Occlusion –types and uses
15. Nystagmus
16. A.V. Syndromes
17. Testing of ARC
18. Amblyopia
19. Disorders of accommodation
20. Paediatric Visual acuity assessment
21. Paediatric Refraction
22. Neural aspects of binocular vision

4. OPHTHALMIC INSTRUMENTS AND APPLIANCES

1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope
3. Slit Lamp: HAAG-Streit
4. Photo-slit lamp
5. Lensometer. Lens gauge
6. Tonometer
7. Fundus Camera
8. Ecternal eye Photography
9. Auto-refractometer
10. Corneal Examination -1. Placido disc
11. Corneal Examination -2. Keterometer
12. Corneal Examination -3. V KG
13. Corneal Examination -4. Specular Microscopy
14. Corneal Examination -5. Aesthesiometer
15. Exophthalmometer
16. Perimeter – Manual & Automated
17. Orthoptics Instruments- Haploscope/Home devices
18. Nerve fiber analyzer
19. Frequency doubling perimeter
20. Non Contact Tonometer
21. Heidelberg Analmascope
22. Pachometers
23. Contrast sensitivity tests
24. Glare acuity tests
25. Colour vision tests
26. Dark adaptometer

PRACTICAL SUBJECTS FOR SECOND YEAR

OCULAR PHARMACY AND PHARMACOLOGY

1. Quality Control:
   - 1.1 Sterilization
   - 1.2 pH measurement
   - 1.3 Osmolarity
   - 1.4 Spectrophotometry for concentration
2. How to prepare following eye drops:
   - 2.1 Pilo-clonidine eye drops
   - 2.2 Artificial eye drops
   - 2.3 Glycerin eye drops
   - 2.4 Homatropine eye drops
   - 2.5 EDTA eye drops
   - 2.6 Sulphacetamide eye drops

2.7 Dexamethasone eye drops
2.8 Methylecellulose eye drops
2.9 Saline eye drops
2.10 Sodium citrate eye drops

3. MK Media Preparation
4. Autologous serum eye drops preparation
5. Dilution of drug in different concentration
6. Steroid detection test

2. **REFRACTION**
   1. Refraction and prescription of glasses in OPD
3. **INVESTIGATIVE OPHTHALMOLOGY**
   1. Manifest squint work-up
   2. Paralytic squint work-up
   3. Pleoptics
   4. Orthoptic Exercise
4. **OPHTHALMIC INSTRUMENTS AND APPLIANCES**
   1. Lensometer, Lens gauge
   2. Tonometer
   3. Placido disc
   4. Keterometer
   5. VKG
   6. Specular Microscopy
   7. Exophthalmometer
   8. Perimeter
   9. Non Contact Tonometer
   10. Slit Lamp: Haag-Streit
   11. Photo-slit lamp
   12. Fundus Camera
   13. Contrast sensitivity tests
   14. Glare acuity tests
   15. Colour vision tests
   16. Dark adaptometer

THEORY SUBJECT FOR THIRD YEAR

1. CLINICAL & AD VANCED ORTHOPTICS

1. Orthoptic-General concept
2. AC/A ratio.
3. Measurements of angle squint
4. Latent squint
5. Maddox rod
6. Maddox wing
7. Synoptophore
8. Manifest concomitant
9. Squint Concomitant
10. Paralytic Squint
11. Head posture and its siguificance
12. Hess Screening, and its Interpretations
13. Pleoptics
14. Occlusion –types and uses
15. Nystagmus
16. A.V. Syndromes
17. Testing of ARC
18. Amblyopia
19. Disorders of accommodation
20. Paediatric visual acuity assessment
21. Paediatric Refraction
22. Neural aspects of binocular vision

2. CLINICAL & AD VANCED OPTICS

1. Emmetropia & Amnetropia –Aetiology, Population. Distribution, Growth of eye.
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-Phakia
6. Presbiopia
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular re/ex
10. Accommodation & Convergence -1. Far point, near point, range, amplitude of accommodation
11. Retinoscopy –Principle & Methods
12. Objective Refraction
13. Subjective Refraction
14. Cross Cylinder

3. CONTACT LENS

1. History of Contact Lens
2. Corneal Anatomy and Physiology
3. Corneal Physiology and Contact Lens
4. Preliminary Measurement and Investigations
5. Slit Lamp Biomicroscopy
6. Contact Lens materials
7. Optics of the Contact Lens
8. Glossary of Terms: Contact Lenses
9. Indications and Contra Indications contact Lens
10. Rigid gas permeable contact lens design
11. Soft Contact lens design & manufacture
12. Kertometery, Placido's disc, Tonography
13. Fitting philosophies

14. Fitting of Spherical SCL and Effect of parameter changes
15. Astigmatism correction options
16. Fitting Spherical RGP contact Lenses, Low OK, High OK
17. Effects of RGP contact Lenses parameter changes on lens fitting
18. Fitting in Astigmatism (Sph. RGP)
19. Follow-up post fitting examination
20. Follow-up Slit Lamp examination
21. Fitting in Keratoconus
22. Fitting in Aphakia, Pseudophakia
23. Cosmetic Contact Lenses
24. Fitting Contact Lens in children
25. Toric Contact Lenses
26. Bifocal Contact Lenses
27. Therapeutic Lenses/Bandage lenses
28. Contact lens following ocular surgeries
29. Disposable contact lenses, frequent replacement and Lenses
30. Use of Specular Microscopy and pachymetry in Contact Lenses
31. Care & maintenance of Contact Lenses
32. Contact Lens modifications of finished lenses
33. Instrumentation in Contact lens practice
34. Checking finished lenses parameters
35. Recent developments in Contact Lenses
36. Review of lenses available in India

4. **CLINICAL & ADVANCED REFRACTION**
   1. Emmetropia & Ammetropia –Aetiology, Population. Distribution, Growth of eye.
   2. Myopia
   3. Hypermetropia
   4. Astigmatism
   5. Aphakia/Pseudo-Phakia
   6. Presbiopia
   7. Keratoconus
   8. Post-Op. Refractive errors
   9. Refraction of irregular re/ex
   10. Accommodation & Convergence -1. Far point, near point, range, amplitude of accommodation
   11. Retinoscopy –Principle & Methods
   12. Objective Refraction
   13. Subjective Refraction
   14. Cross Cylinder
   15. Low- Vision aids: Techniques & microscopes
   16. Rehabilitation of blinds
5. **EYE BANK**
   1. Publicity
   2. How to donate your eyes
   3. Preservation of eyes
   4. Pre-operative Instruction
   5. Post-operative Instruction
   6. Latest techniques for Preservation of donor Cornea
6. **COMMUNITY OPHTHALMOLOGY**
   1. Concepts of community Ophthalmology-I
   2. Concepts of community Ophthalmology-II
   3. The Epidemiology of Blindness (General Principles) – I
   4. The Epidemiology of Blindness (General Principles) – II
   5. The Epidemiology of Blindness (Disease specific strategies) – III
   6. The Epidemiology of Blindness (Disease specific strategies) – IV
   7. Survey Methodological – I

8. Survey Methodological – II
9. Survey Methodological – III
10. Screening Procedures in Ophthalmology – I
11. Screening Procedures in Ophthalmology - II
12. School eye screening programme
13. Primary eye care
14. Organization of Out reach services
15. Organization of Reach-in-programme
16. Information, Education, communication
17. Rehabilitation of the visually handicapped
18. National programme for control of Blindness-I
19. National programme for control of Blindness-I
20. Vision 2020: The Right to sight

7. **INVESTIGATIONS IN CLINICAL OPHTHALMOLOGY**
   1. Principle, Techniques and preparation of the patient
   2. ERG
   3. Electro-Oculomyo-gram
   4. Ultra-sono-graphy
   5. Tonography
   6. Berman's Locator/Foreign body locator
   7. Flurescein Angiography
   8. Ocular Photography –anterior segment
   9. Dark Adaptometry: Adaptation & Adaptometer
   10. Syringing & Lacrimal function Test
   11. Gonioscopy
   12. Pachometry
   13. Perimetry
   14. Laser Therapy
   15. Contrast Sensitivity
   16. Slit Lamp
   17. VKG
   18. Specular Microscopy
   19. Fundus Photography
   20. Colour Vision Investigations- Ishhara charts, E-G Lantern, Negal's anomaloscope, 100 Hue Test
   21. A –Scan Biometry
   22. Heidelberg Retina-tomography HRT-II
   23. Nerve Fiber analyzer
   24. Frequency doubling perimeter
   25. Non Contact Tonometry
   26. UBM
   27. OCT

8. **MANAGEMENT OF OT**
   1. Introduction to Ocular in general
   2. Asepsis: How to achieve

APPENDIX – I

B.Sc Optometry Phase-I

Sl. No	Paper Theory	Subject	Theory Final	Internal Assessment	Total
1	I	Human Anatomy & Physiology	70	30	100
2	II	Ocular Anatomy, Pathology & Microbiology	70	30	100
3	III	Ocular Physiology & Biochemistry including Binocular reflexes & its maintenance	70	30	100
4	IV	Optics	70	30	100
		Practical Including Viva			
6	I	Anatomy & Physiology	70	30	100
7	II	Ocular Pathology & Microbiology	70	30	100
8	III	Optics	70	30	100
9	IV	Lens Grinding & fitting	70	30	100

APPENDIX – II

B.Sc Optometry Phase-II

Sl. No	Paper Theory	Subject	Theory Final	Internal Assessment	Total
1	I	Pharmacology & Pharmacy	70	30	100
2	II	Refraction (including prescription, making & fitting of glasses)	70	30	100
3	III	Investigative Ophthalmology	70	30	100
4	IV	Ophthalmic Instrument & Appliances	70	30	100
		Practical Including Viva			
6	I	Pharmacology & Pharmacy	70	30	100
7	II	Refraction (including prescription, making & fitting of glasses)	70	30	100
8	III	Special investigation, including Orthoptics	70	30	100
9	IV	Instrument & Appliances	70	30	100

APPENDIX – III

B.Sc Optometry Phase-II

Sl. No	Paper Theory	Subject	Theory Final	Internal Assessment	Total
1	I	Clinical & advanced Optics & Orthoptics	70	30	100
2	II	Clinical Refraction and Contact lenses	70	30	100
3	III	Community Ophthalmology and Eye Bank	70	30	100
4	IV	Investigation in Clinical Ophthalmology and management of OT	70	30	100
		Practical Including Viva			
6	I	Optics & Orthoptics	70	30	100
7	II	Refraction and Contact lenses	70	30	100
8	III	Community Ophthalmology and Eye Bank	70	30	100
9	IV	Investigation in Clinical Ophthalmology and management of OT	70	30	100