Resolution No. 07, Series of 1994

Promulgation of Syllabi for the Subjects in the Optometry Licensure Examination

Board of Optometry

WHEREAS Sections 12 and 13 of R.A. 1998 (the Optometry Law) provide the objects and scope of the optometry examinations; WHEREAS the Commission issued a Memorandum Circular No. 08, Series of 1992, directing every Board to prescribe and adopt a syllabus for every subject in the licensure examinations; WHEREAS every syllabus containing the concepts/ topics with the corresponding level of knowledge/ proficiency shall be the basis for the questions that will be encoded in the question banks; WHEREAS a syllabus for a subject will not bring about overlapping of subjects and will accordingly guide the Board Member, the examinees and the reviewers; WHEREAS after consultation, the Board has come out with the syllabi for the examination subjects; NOW, THEREFORE, by virtue of Sec. 10 of R.A. 1998, the Board hereby resolved, as it now so resolves, to prescribe, adopt, and promulgate the syllabi for the subjects in the Licensure Examinations (Annex ÒAÓ); FURTHER, RESOLVED, that this Resolution be widely disseminated and circularized to all optometry schools or colleges; FINALLY, RESOLVED, that this Resolution upon its approval by the Commission, shall be effective two (2) months before the licensure examination after fifteen (15) days after the publication thereof in the Official Gazette or newspaper of general circulation, whichever is earlier. Done in the City of Manila, this 28th day of July, 1994.

PRIMITIVA U. PEREZ-SISON
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HERMOGENES P. POBRE

Commissioner

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Associate Commissioner

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GENERAL ANATOMY
AND OCULAR ANATOMY

1. Gross Anatomy
   - 1.0 Thorax
   - 1.1 Lungs (lobes; root structures; pleura, broncho-pulmonary segments; bronchial tree)
   - 1.2 Pulmonary circulation
   - 1.3 Heart (surfaces; coronary circulation; pericardium, chambers; valves; conduction system)
   - 1.4 Superior mediastinum (great vessels; trachea; esophagus vagus and prenic nerves)

2.0 Abdomen
   - 2.1 Liver
   - 2.2 Accessory digestive organs (gall bladder, pancreas)
   - 2.3 Other internal organs (spleen; kidney; suprarenal gland)

3.0 Head and Neck
   - 3.1 Skull (bones; sutures; fossae; foramina; cranial fossae; tempo-mandibular joint)
   - 3.2 Superficial and deep arteries, veins and lymphatics
   - 3.3 Muscles of facila expression and mastication
   - 3.4 Muscles of the neck (platysma, sternocleidomastoid, trapezius)
   - 3.5 Peripheral cranial nerve distributions
   - 3.6 Cervical triangles and their contents; root of neck
   - 3.7 Salivary glands
   - 3.8 Nose (framework; cavities; contents)
   - 3.9 Para-nasal sinuses and their relations to the orbit and orbital contents
   - 3.10 Ear (outer ear; middle ear; walls; muscles; inner ear)
   - 3.11 Dural Venous sinuses

4.0 Systems of the Body
   - 4.1 Endocrine 4.6 Reproductive
   - 4.2 Skeletal 4.7 Respiratory
   - 4.3 Nervous 4.8 Muscular

4.4 Circulatory 4.9 Excretory
4.5 Digestive

5.0 Anatomy of the eye, ocular adnexa and visual pathway
5.1 Orbit
5.1.1 Contents (extraocular muscles, nerves blood vessels, fat compartments, fascial)
5.1.2 Anatomical relationships among orbital structures
5.1.3 Bones of the orbit
5.1.4 Foramina and openings of the orbit (location, contents)

5.2 Extraocular muscles
5.2.1 Names
5.2.2 Origins
5.2.3 Insertions
5.2.4 Innervation, blood supply
5.2.5 Relationship to other orbital structures

5.3 Blood Supply
5.3.1 Branches of internal and external carotid arteries related to the orbit, eyelid and upper face
5.3.2 Branches of the internal and external jugular veins
5.3.3 Dural sinuses
5.4 Ocular and Orbital Nerves
5.4.1 Cranial nerve I, III, IV, V,VI,VII (intracranial and extracranial course, branches, functions, tissue innervated)
5.4.2 Parasympathetic nerves (course, branches, tissue innervated)
5.4.3 Sympathetic nerves (course, branches, tissue innervated)
5.5 Eyelid
5.5.1 Anatomic boundaries
5.5.2 Layers
5.5.3 Muscles (actions)
5.5.4 Glands (secretions, function)
5.5.5 Blood supply and drainage, lymphatic drainage
5.5.6 Innervation
5.6 Eyebrow (Structure and Function)
5.7 Conjunctiva
5.7.1 Location
5.7.2 Composition (layers, cell types, glands)
5.7.3 Relationship with tarsal plate, extraocular muscles, sclera, Tenons capsule, cornea)
5.7.4 Blood supply and venous drainage, lymphatic drainage
5.7.5 Innervation
5.7.6 Plica semilunaris (composition)
5.7.7 Caruncle (composition)
5.8 Lacrimal System
5.8.1 Lacrimal gland (structure, innervation, blood supply)
5.8.2 Accessory lacrimal glands (location,function)
5.8.3 Distribution of tears (role of eyelids)
5.8.4 Drainage of tears; nasolacrimal duct (cellular lining); lacrimal papillae (location: lacrimal puncta; canaliculi (relationship to Horners Muscle); lacrimal sac (relationship to medial palpebral ligament, Horners Muscle, orbicularis oculi; septum orbitale)
5.8.5 Lacrimal fossa (bony structure)
5.8.6 Nasolacrimal canal (bony composition, relationship to maxillary sinus)
5.8.7 Regulation of basic tear secretion
5.8.8 Regulation of basic reflex secretion
5.8.9 Distribution of tears
5.8.10 Drainage of tears (role of Horners muscle)
5.9 Cornea
5.9.1 Normal dimensions including diameter, radii of curvature (anterior and posterior) and thickness (central and peripheral)
5.9.2 Temperature
5.9.3 Epithelium
5.9.4 Bowmans zone
5.9.5 Stroma
5.9.6 Descemets membrane

- 5.9.7 Endothelium
- 5.9.8 Innervation
- 5.9.9 Regeneration
- 5.9.10 Corneal nerve development (origin)
- 5.9.11 Factors affecting corneal size, curvature, transparency

5.10 Sclera
- 5.10.1 Size
- 5.10.2 Radius of Curvature
- 5.10.3 Thickness
- 5.10.4 Color
- 5.10.5 Relationship to conjunctive, Tenons capsule, suprachoroidal space
- 5.10.6 Emissaria (contents, location)
- 5.10.7 Composition
- 5.10.8 Lamina cribrosa (structure)

5.11 Anterior Chamber and Angle
- 5.11.1 Shape and volume
- 5.11.2 Boundaries
- 5.11.3 Diameter and depth
- 5.11.4 Trabecular meshwork (components, ultra-structure)
- 5.11.5 Stroma (composition)
- 5.11.6 Sphincter muscle (type, composition, innervation)
- 5.11.7 Anterior epithelium (ultrastructure)
- 5.11.8 Dilator muscle (type, composition, innervation)
- 5.11.9 Posterior epithelium (relationship to lens, anterior, epithelium, pupil margin)
- 5.11.10 Blood supply, venous drainage
- 5.11.11 Innervation

5.12 Iris
- 5.12.1 Gross landmarks, zones
- 5.12.2 Diameter
- 5.12.3 Coloration (factors controlling)
- 5.12.4 Anterior border layer (composition, ultrastructure)
- 5.12.5 Stroma (composition)
- 5.12.6 Sphincter muscle (type, composition, innervation)
- 5.12.7 Anterior epithelium (ultrastructure)
- 5.12.8 Dilator muscle (type, composition, innervation)
- 5.12.9 Posterior epithelium (relationship to lens, anterior, epithelium, pupil margin)
- 5.12.10 Blood supply, venous drainage
- 5.12.11 Innervation
- 5.13 Pupil
- 5.13.1 Size
- 5.13.2 Location

5.14 Posterior Chamber
- 5.14.1 Size and volume
- 5.14.2 Boundaries

5.15 Ciliary Body
- 5.15.1 Gross morphology
- 5.15.2 Dimensions
- 5.15.3 Relationship to sclera, anterior chamber, iris posterior chamber, lens and retina
- 5.15.4 Pars Plana (location, components)
- 5.15.5 Pars Plicata (location, components)
- 5.15.6 Supraciliaris
- 5.15.7 Stroma (components)
- 5.15.8 Ciliary muscle (components, origin, insertion, action innervation)
- 5.15.9 Pigmented epithelium
- 5.15.10 Non-pigmentation epithelium
- 5.15.11 Blood supply and venous drainage
- 5.15.12 Drainage

5.16 Lens, Zonule
- 5.16.1 Zonule
- 5.16.2 Location of the lens
- 5.16.3 Epithelium (capsule, ultrastructure)
- 5.16.4 Cortex (composition of the lens fibers)
- 5.16.5 Nuclei (various names and locations)
- 5.16.6 Sutures (location)

5.17 Choroid
- 5.17.1 Function of choroid
- 5.17.2 Physiological relationships between choroid and retina
- 5.17.3 Extent
- 5.17.4 Thickness
- 5.17.5 Relationship to lamina fusca of sclera
- 5.17.6 Choriocappillaris (ultrastructure, type of capillaris)
- 5.17.7 Stroma (composition)
- 5.17.8 Blood supply
- 5.17.9 Venous drainage
- 5.17.10 Innervation
- 5.17.11 Bruch membrane (location, composition)

5.18 Vitreous
- 5.18.1 Functions
- 5.18.2 Composition (Physical Characteristics, aging changes)
- 5.18.3 Volume
- 5.18.4 Shape
- 5.18.5 Attachments to retina and lens (ultrastructure)
- 5.18.6 Patellar fossa (location)
- 5.18.7 Metabolism
- 5.18.8 Anterior hyaloid and Posterior hyaloid (location)
- 5.18.9 Cortex (composition)
- 5.18.10 CloquetÕs canal (location, origin)

5.19 Retina
- 5.19.1 Layers (components of each, ultrastructure)
- 5.19.2 Relationship between retinal pigment epithelium and BruchÕs Membrane
- 5.19.3 Relationship between retinal pigment epithelium and photoreceptor outer segments
- 5.19.4 Synaptic connections within retina
- 5.19.5 Blood supply
- 5.19.6 Anatomical area (location, size, composition) of area centralis, perifovea, parafovea, foveola, macula lutea, ora serrata (ultrastructure)
- 5.19.7 Composition of visual pigments
- 5.19.8 Formation of visual pigments
- 5.19.9 Stages of visual cycle
- 5.19.10 Function of bipolar, horizontal, amacrine and ganglion cells (receptive fields)
- 5.19.11 Retinal neural mechanisms of color vision (spatial temporal and chromatic)

5.20 Optic Nerve
- 5.20.1 Surface features
- 5.20.2 Prelaminar portion (composition, blood supply)
- 5.20.3 Laminar portion (composition, blood supply)
- 5.20.4 Retrolaminar portion (composition, blood supply)
- 5.20.5 Central retinal artery and vein (location)
- 5.20.6 Optic disc/cup

5.21 Visual Pathway
- 5.21.1 Anatomy related to visual pathology

5.22 Eyelid
- 5.22.1 Tissue origin
- 5.22.2 Lid folds
- 5.22.3 Blink reflexes (spontaneous, menace, auditory, touch, dazzle)
- 5.22.4 Role of eyelids in production, distribution and drainage of tears
- 5.22.5 Functions

5.23 Lacrimal Apparatus
- 5.23.1 Tissue origin of lacrimal glands (main, accessory)
- 5.23.2 Appearance of tearing and weeping (reflexes)
- 5.23.3 Tissue origin of lacrimal and nasal passages

5.24 Tears
- 5.24.1 Functions of tears (wet eye, smooth surface, anti-bacterial, etc.)
- 5.24.2 Composition of tears (3 layers)
- 5.24.3 Function of each layer of tears
- 5.24.4 Source of each layer of tears

5.24.5 Basic tear secretion
5.24.6 Reflex tear secretion
5.24.7 Tear film stability

5.25 Intraocular Pressure
5.25.1 Mean pressure
5.25.2 Diurnal variation
5.25.3 Factors controlling aqueous production (capillary pressure, active transport)
5.25.4 Factors controlling aqueous outflow (IOP, episceral venous pressure, etc.)
5.25.5 Nervous system regulation of IOP
5.25.6 Systematic factors influencing IOP (blood osmolarity, body position, blood pH, blood pressure,
etc.)
5.26 Aqueous
5.26.1 Functions of aqueous
5.26.2 Volume, osmolarity, viscosity
5.26.3 Formation (ultrafiltration, active transport)
5.26.4 Factors influencing rate of flow
5.26.5 Composition
5.26.6 Blood aqueous barriers

5.27 Lens
5.27.1 Functions of lens
5.27.2 Composition of lens
5.27.3 Difference in composition between lens and aqueous
5.27.4 Metabolism of lens (various pathways essential to the lens)
5.27.5 Type of lens proteins
5.27.6 Theories of lens transparency
5.27.7 Mitotic activity of lens epithelium
5.27.8 Aging changes in composition of the lens

GENERAL PATHOLOGY

1.0 Inflammation and Repair
1.1 Vascular and cellular changes in acute inflammation
1.2 Causes of histological changes in chronic inflammation
1.3 Causes and features of granulomatous inflammation
1.4 Resolution of acute and chronic inflammation
1.5 Events and local factors affecting wound healing and repair
1.6 Systemic factors affecting the rate of wound healing

2.0 Host defenses and responses to infection
2.1 PMN, macrophage and eosinophil function
2.2 Chemotaxis, phagocytosis, and bactericidal activities of these cells
2.3 Role of antibody in phagocytosis, and destruction of microorganisms

3.0 Cellular Disease
3.1 Cell injury
3.2 Morphologic changes associated with cell injury or death

4.0 Neoplasia
4.1 Classification of neoplasms
4.2 Cause of neoplasms (viral, chemical, radiation)
4.3 Differences between benign and malignanttumors

5.0 Hematopoietic and lymphoid system
5.1 Disorders of RBC, WBC (non-neoplastic)
5.2 Neoplastic disorders of WBC-leukemias
5.3 Non-neoplastic disorders of lymph nodes
5.4 Neoplastics disorders of lymph nodes

6.0 Respiratory system
6.1 Pulmonary diseases secondary to heart failure
6.2 Infectious diseases of the lung
6.3 Neoplastic diseases of the lung

7.0 Gastrointestinal System
7.1 Disorders of the stomach (gastritis, ulcers)

7.2 Disorders of the intestines and colon (enteritis, colitis)
7.3 Neoplastic disorders of the gastrointestinal tract

8.0 Cardiovascular hemodynamic disorders
8.1 Congestion, edema (cause, characteristics)
8.2 Shock (classification, causes, complications)
8.3 Thromboembolism (classification, causes,complications)

8.4 Systemic hypertension (causes, complications)
8.5 Atherosclerosis (causes, development, complications)
8.6 Aneurysms (classification, development, complications)

9.0 Heart Disease
9.1 Coronary artery disease (causes, complications)
9.2 Hypertensive heart disease (causes, complications)
9.3 Rheumatic heart disease (causes, clinical features, pathologic features)
9.4 Infectious encarditis (causes, clinical features, pathologic features)
9.5 Cardiomyopathies (causes, clinical features, pathologic features)

10.0 Endocrine Disease
10.1 Diabetes (classification, pathology, clinical manifestations)
10.2 Hyperthyroidism
10.3 Hypothyroidism
10.4 Goiter, Graves disease
10.5 Hyperparathyroidism
10.6 Hypoparathyroidism
10.7 Hyperpituitarism
10.8 Hypopituitarism
10.9 Hypercorticism (Cushings disease)
10.10 Hypocorticism (Addisons disease)
10.11 Disorders of adrenal medulla

11.0 Nervous System Disease
11.1 Cerebrovascular disease, stroke
11.2 Headaches
11.3 Infectious diseases of the central nervous system
11.4 Nervous system neoplasms
11.5 Muscular atrophy, muscular dystrophy
11.6 Demyelinating diseases
11.7 Leukodystrophies, gangliosidoses

12.0 Nutritional Disorders
12.1 Malabsorption
12.2 Alcoholism

OCULAR PATHOLOGY
1.0 Eyelids
1.1 Congenital anomalies
1.2 Disease of the lid margin, glands, skin, cilia
1.3 Tumors
1.4 Trauma

2.0 Orbit
2.1 Congenital anomalies; displacement of the eyeball
2.2 Inflammations
2.3 Tumors
2.4 Endopthalmos and Exopthalmos

3.0 Lacrimal Apparatus
3.1 Diseases of the lacrimal gland and ducts

4.0 Conjunctiva
4.1 Pinquecula, concretions, subconjunctival hemorrhage, anomalies of circulation
4.2 Conjunctivitis
4.3 Pterygium
4.4 Tumors
4.5 Trauma

5.0 Cornea
- 5.1 Congenital anomalies
- 5.2 Degenerative processes, dystrophies
- 5.3 Keratitis and keratopathies
- 5.4 Trauma
- 5.5 General pathologic considerations (vascularization, edema)

6.0 Sclera
- 6.1 Pigmentation
- 6.2 Ectasia and staphyloma
- 6.3 Scleritis, episcleritis

7.0 Iris, Ciliary Body and Pupil
- 7.1 Congenital anomalies
- 7.2 Autoimmune reactions of iris and ciliary body
- 7.3 Primary and secondary diseases of iris and ciliary body
- 7.4 Tumors
- 7.5 Anomalies of pupillary reactions
- 7.6 Trauma

8.0 Lens and Vitreous Body
- 8.1 Congenital anomalies
- 8.2 Cataract: symptoms, differential; diagnoses, secondary involvements
- 8.3 Luxation and subluxation
- 8.4 Anomalies of the vitreous body; fluidity, foreign bodies, muscae volitantes, hemorrhages

9.0 Choroid
- 9.1 Congenital anomalies of the choroid
- 9.2 Inflammations of the chorid
- 9.3 Tumors

10.0 Retina
- 10.1 Congenital anomalies
- 10.2 Diseases: dystrophic, infectious, tumors, etc.
- 10.3 Retrolental fibroplasia and related entities
- 10.4 Circulatory disturbances
- 10.5 Detachment

11.0 Optic nerve
- 11.1 Inflammatory changes
- 11.2 Tumors
- 11.3 Trauma
- 11.4 Toxic Amblyopias
- 11.5 Optic Atrophy
- 11.6 Papilledema

12.0 Ocular Tension and Glaucoma
- 12.1 Intraocular pressure
- 12.1.1 Physiological
- 12.1.2 Glaucomatous
- 12.2 Primary glaucoma
- 12.2.1 Open angle
- 12.2.2 Angle-closure
- 12.3 Secondary glaucoma
- 12.4 Low tension glaucoma
- 12.5 Visual field changes
- 12.6 Differential diagnoses

13.0 Ocular Manifestations of General Disease
- 13.1 Syphilis; tuberculosis, rheumatism, nephritis, diabetes, arteriosclerosis, cardiac involvement, etc.
- 13.2 Diseases of metabolism
- 13.3 Trauma

THEORETICAL OPTOMETRY

1.0 Refraction Conditions
- 1.1 Refractive Status (ametropia, hyperopia, myopia, presbyopia astigmatism, and emmetropia)

1.2 Incidence & Distribution, Definition, Classification, Etiology, and its Management
1.3 Determination of refractive status both objective (retinoscopy, autorefractors) and subjectively both (monocular and bin ocular)

2.0 Accommodative mechanism
2.1 Definition, Classification
2.2 Determination of accommodative mechanisms function both objectively and subjectively including dynamic both retinos copy, amplitude of accommodation, cross cylinder tests, negative and positive relative accommodation.
2.3 Identify anomalies of accommodation (including ill sustained accommodation, insufficiency of accommodation spasm of near reflex, inertia of accommodation), aphakia, anomalies of ACA ratio and its management.

3.0 Binocular Vision

3.1 Definition, Etiology, Symptoms and Distribution of Binocular Anomalies which includes: heterophoria, tropia, amblyopia, anisometropia, antimetropia, aniseikonia, suppression and abnormal retinal correspondence and its management.

3.2 Determination of the particular muscle involved in the anomalies of binocular vision.

3.3 Tests to confirm the extent of binocular vision anomaly

3.4 Procedures and techniques in analyzing and diagnosing visual disorders such as the OEP method, (SOAP) problem oriented approach, Morgans correlates, Neumullers criterion, Sheards criterion, and Percivals criterion.

4.0 Low Vision
4.1 Definition, Etiology, Classification and Symptoms
4.2 Diagnosis
4.3 Management - visual acuity, special refraction techniques, visual fields, reading skills, effects of illumination, magnification, determination, analysis or interpretation of personal, social, vocational or psychological patient needs and factors, available aids, theory and design, telescope and micros copicsystems, projection instruments, pinhole and other special devices.

5.0 Significance of Visual Tests

6.0 Normal Expected of Visual Test Findings

PRACTICAL OPTOMETRY

1.0 Assessment of Visual Functions
1.1 Case History

2.0 External Examination

3.0 Preliminary Examination
3.1 Visual Acuity
3.2 Ocular Motility (versions, vergence, fixation)
3.3 Pupillary reflexes (direct, indirect, consensual accommodative)
3.4 Ocular Dominance
3.5 Interpupillary Distance
3.6 Negative and Positive Convergence
3.7 Negative and Positive Accommodation

4.0 Objective clinical procedures such as opthalmoscopy, biomicroscopy, ophthalmometry, and retinoscopy

5.0 Subjective Testing

5.1 Monocular Subjective Techniques (fogging, determination and refinement of astigmatic correction,

determination of spherical component, bichrome test)
5.2 Binocular Subjective Techniques (Biochrome balancing, Turville Infinity Balance Test, Prism Dissociation Test, Balancing Technique with Polarizing filters)
5.3 Equalization Techniques

6.0 All other tests necessary to assess the refractive, accommodative and binocular vision status
6.1 Phorometric Tests

7.0 Contact Lenses
7.1 Anterior Eye Anatomy and Physiology
7.1.1 Corneal Topography
7.1.2 Corneal Metabolism
7.1.3 Examination of Anterior Eye-Biomicroscopy (use of slit lamp, types of illumination, staining)
7.2 Introduction of Contact Lens
7.2.1 Definition, History, Classification, Uses Advantages and Disadvantages vs. Spectacle
7.2.2 Contact Lens Material
7.2.2.1 Hard Contact Lens Materials and Manufacturing
7.2.2.2 Soft Contact Lens Materials and Manufacturing
7.2.3 Vision and Optics of Contact Lenses (effects on accommodation, convergence, magnification)
7.2.4 Contact Lens Design (soft and hard contact lens) and verification (writing complete contact lens
prescription)
7.3 Examination Procedures and Patient Selection
7.3.1 Indications and Contraindications
7.3.2 Calculation of Residual Astigmatism for Lens Selection

7.4 Contact Lens Fitting (PMMA, RGP, SCL, Toric)
7.4.1 Fitting Methods and Philosophies (effect of different parameters to lens fitting evaluation)
7.4.2 Insertion and Removal Techniques
7.4.3 Lens Care and Maintenance (disinfection methods, pharmacology of contact lens solutions)
7.4.3.1 Wearing and Aftercare Schedule
7.4.3.2 Contact Lens Deposits

7.5 Ocular Response and Contact Lens related ocular complications to Contact Lens wear
7.5.1 Ocular effects of Contact Lens (PMMA, RGP, SCL, Extended vs. Daily Wear), Causes and its
Management
7.5.2 Contact Lens Complications (Soft daily and extended, RGP daily and extended, PMMA)

7.6 Special Contact Lens Fitting
7.6.1 Keratoconus
7.6.2 Bifocal
7.6.3 Aphakia

THEORETICAL OPTICS
1.0 Nature and Propagation of Light
1.1 Definition
1.2 Theories of Light (wave, electromagnetic, corpuscular, quantum and Fresnels)
1.3 Sources of Light
1.4 Photometry, Definitions and Characteristics
1.4.1 luminous intensity
1.4.2 illumination
1.4.3 luminous flux
1.4.4 solid angle
1.4.5 measurement of light (metercandles, footcandles, lumen and lambert)
1.4.6 laws on illumination
1.4.7 shadow formation
1.5 Electromagnetic Spectrum
1.6 Diffraction
1.7 Transmission and Absorption
1.8 Polarization
1.9 Interference (negative and positive)
1.10 Radiation laws
1.11 Color Temperature
1.12 Flourescence, Phosphorescence, Electroluminescence

1.13 Lasers
2.0 Basic Optics
2.1 Definition, terminology, laws and characteristics of;
2.1.1 reflection
2.1.2 refraction
2.2 Formation of images (magnification, deviation and abberations) on plane and curved mirrors and refracting media
2.3 Characteristics of lenses (spherical, spherocyl, and cylindrical)
2.3.1 lens formula, equations, effectivity and equivalent
2.3.2 power of thick lenses
2.3.3 graphical construction of lens combination and identification of cardinal point
2.3.4 Characteristics of Ophthalmic prisms
2.3.4.1 measurement of amount of deviation
2.3.4.2 ray tracing within a prism
2.3.4.3 decentrations
2.3.4.4 slab off prisms
2.3.4.5 Fresnels prisms
2.4 Principles of optical instruments
2.4.1 lensmeters
2.4.2 keratometers
2.4.3 ophthalmoscope
2.4.4 retinoscope
2.4.5 stereoscope
2.4.6 lasers
2.5 Mirrors
2.5.1 Planar and Spherical reflection
2.5.2 Proportion of light reflected from a surface (Fresnels Law)
2.5.3 Focal power, focal length, and curvatures
2.5.4 Object - Image relationship
2.5.5 Magnifications
2.5.6 Lens Mirror systems
2.5.7 Ray Tracing
2.6 Thin Prism
2.6.1 Unit of measurement
2.6.2 Prism deviation
2.6.3 Combination of thin prisms
2.6.4 Resolution of obliquely prisms into horizontal and vertical components
2.6.5 Total Internal Reflection

OPHTHALMIC OPTICS
1.0 Physical Characteristics of Ophthalmic Lenses
1.1 Definitions, Classifications
1.2 Geometry of the lens surfaces (spherical, cylindrical, toric and aspheric)
1.3 Base Curves (form of lenses) and specificationsof lens size and shapes
1.4 Material (index of refraction, dispersion, and hardness
1.5 Lens thickness (center and edge thickness, saggita)
2.0 Optical characteristics of ophthalmic lenss
2.1 Locations of and relationships between the optic axis, optical center, geometric center, and major reference points)
2.2 Aberrations of lenses and corrective design
2.3 Verifications of lens prescriptions
2.4 Writing and Transposing lens Prescriptions
2.5 Effect of lens tilt (spheres and sphero cylinder about the principal meridian)
2.6 Effective Power (for near and for changes in distances)
2.7 Spherocylinders equivalence of obliquely crossed cylinder
3.0 Ophthalmic Prisms and Prismatic effect of Lenses
3.1 Thickness differences across a prism
3.2 Prismatic effects of the lens (Spheres, Spherocylinder)
3.3 Decentration
3.4 Correction of vertical prism effect
3.4.1 Slab-off (front, back, top, bottom)
3.4.2 Double slab-off
3.4.3 Dissimilar segments
3.4.4 Compensated R segments
3.4.5 Prism segments
4.0 Bifocal and multifocal lenses
4.1 Types (fused, one piece, progressive and blended lenses)
4.2 Methods of altering or generating additional lens power

4.3 Fitting Techniques for bifocal and multifocal lenses
4.4 Specifying and Selecting multifocal lenses (height, size, shape, and location of segment)
5.0 Absorptive lenses
5.1 Effects of Infra red, visible and ultraviolet radiation of the eye
5.2 Specifications of lens tints and absorptive coatings including spectral transmission curves
5.3 Characteristics of Photochromic Lenses
5.4 Relationship between lens thickness and spectral transmission
5.5 Special Occupational requirements
6.0 Impact Resistance
6.1 Degree of resistance of ophthalmic lens materials
6.2 Method of verifying impact resistance
6.3 Specifications of occupational safety lenses
7.0 Processing of Lens Prescription
7.1 Preparation and actual grinding of lenses in the different stages
7.2 Bench work and actual mounting or insertion of lens into the frame
8.0 Dispensing Procedures and Techniques
8.1 Concepts of frame selection including optical, occupational, cosmetic, and psychological factors
8.2 Frame Adjustments
8.3 Verification of lens prescription including prismatic effect
9.0 Other characteristics of lens prescription
9.1 Optical and frame consideration of high powered lenses (spheric and aspheric)
9.2 Spectacle Magnification
9.2.1 shape and power factor
9.2.2 iseikonic lens design
9.3 Method of remedying reflections and ghost images

PHYSIOLOGICAL OPTICS
1.0 Dioptrics of the Eye
1.1 Definition
1.2 Processes of Seeing
1.3 Optic constants of the schematic eye
1.4 Ocular refracting surfaces
1.5 Retinal image and Visual angle
1.6 Depth of focus
2.0 Accommodation
2.1 Definition and Classification
2.2 Scheiners Experiment
2.3 Purkinje-Sanson Images
2.4 Lenticular changes
2.5 Theories of accommodation
2.6 Innervation of Ciliary
2.7 Cycloplegics
2.8 Amplitude
2.9 Points and Ranges of Accommodation
2.10 Determination of nearpoint
2.11 Presbyopia
2.12 DonderÕs table
2.13 Accommodation asthenopia
3.0 Ametropia (Introductory)
3.1 Definition, Etiology
3.2 Brachycephalia, Dolichoncephalia
3.3 Law of Silo
4.0 Defects of the Eye
4.1 Sources
4.2 Aberrations
4.3 Axes and angles of the eye (e.g. angle alpha, visual axis and etc.)
4.4 Defects of transparency
4.5 Entoptic Phenomena
5.0 Iris
5.1 Anatomy
5.2 Pupil (definition, mydriasis, miosis and appearance)
5.3 Factors affecting pupil size (for pupil constiction and dilation)
5.4 Pathways of the photo - pupil reflex (direct)
5.5 Pupil reflexes
5.6 Value of light reflex
5.7 Action of chemical compounds
5.8 Pupillary abnormalities (Argyll-Robertsons pupil, Adies pupil etc.)
6.0 Retina

6.1 Layers
6.2 Visual Cells
6.3 Scotopic and Phoopic vision
6.4 Duplicity Theory
6.5 Diurnal and nocturnal animals
6.6 Neural connections and rods and cones
6.7 Nyctalopia and Hemeralopia
6.8 Differentiation between scotopic and photopic vision
6.9 Retinal Changes
6.10 Metabolism
6.11 Seat of retinal stimulation
6.12 Retinal sensitivity: visibility
6.13 Factors influencing the shold
6.14 Laws (e.g. WeberÕs, Fechners, Muellers and others)
7.0 Growth and Decay of Visual sensations including after images
8.0 Repetitive stimulation: flicker
9.0 Colors
9.1 Color Vision
9.2 Color Mixing
9.3 Theories
9.4 Color vision anomalies
10.0 Basis, associated, and conjugated ocular movements
11.0 Visual projection and binocular vision
11.1 Monocular projection
11.2 Single binocular vision (development, prerequisites, doctrine of corresponding points and advantages)
11.3 Diplopia and disparate points
11.4 Binocular projection
11.5 Horopter
11.6 Theories of single binocular vision
11.7 Panums area
11.8 Fixation disparity
12.0 Fusion/Retinal Rivalry
12.1 Definition and Classification
12.2 Theories
12.3 Amplitude of fusion
12.4 Nystagmus
13.0 Stereopsis
13.1 Definition
13.2 Theories
13.3 Monocular depth perception
13.4 Monocular and binocular cues
13.5 Binocular depth perception
14.0 Innervational control of ocular movements
14.1 Innervation
14.2 Result of neural lesions
14.3 Nuclear centers
14.4 Reflex movements of fixation
14.5 Voluntary movements of fixation
14.6 Other cortical centers and reflexes
15.0 Phorias
15.1 Definition, Classification, and Etiology
15.2 Tests
16.0 Visual Efficiency: Perceptual Acuity/Visual Acuity
16.1 Definition of terms
16.2 Retinal regions and sensitivity
16.3 Glare
16.4 Types of visual acuity
16.5 Ocular fatigue
17.0 Optical illusions

ETHICS, ECONOMICS, JURISPRUDENCE
HYGIENE AND SANITATION

1.0 History of Optometry in the Philippines
2.0 Optometric Jurisprudence (Regulatory Laws and Regulations in Optometry)
2.1 Optometry Law (R.A. 1998)
2.1.1 Violations of R.A. 1998 Penal Provision
2.2 Code of Ethics
2.2.1 The Optometrists Responsibilities in General

2.2.2 Relations between Optometrist and his Patients
2.2.3 Duties of Optometrist to the General Public
2.2.4 Duties of Optometrist to other Optometrists
2.2.5 Duties of Optometrists to the Members of the Profession
2.2.6 Unethical Acts and Penal Provisions
2.2.7 Ethical Acts
2.3 Government Regulatory Bodies of Optometry
2.4 Rights of Optometrist
2.5 Rights of Patients
2.6 Liabilities of Optometrist
2.7 Damages
2.8 The Optometrist in Court
2.9 The Proposed Optometry Law
3.0 The Practice of Optometry
3.1 Acts which constitute the Practice of Optometry
3.2 Establishing a Professional Practice
3.3 Types of Practice
3.4 Incidental legal requirement in the practice (PTR, ITR, getting a TIN, registration of books and receipts to BIR, etc.)
4.0 Practice Development/Management
4.1 Employee Relations (qualifications of secretary, labor law, etc.)
4.2 Public Relations/Patient Relations/ Patient Management (efficient technique in handling patients, types of patients,
types of referrals, effective communication in *Optometric Practice*, etc.)
4.3 Business Methods (bookkeeping, dealing with suppliers, business machines needed,
Inventory, etc.)
4.4 Patient Record Management (organization of patient records, how complete is your Px record)
4.5 Money Management (opening bank accounts, scheduling payments to suppliers, purchasing equipment, etc.)
4.6 Perceptual Education (attending COE, postgraduate studies, fellowship, etc. subscription to Journals)
4.7 Protection/Insurance (equipment, location and building)
4.8 Office Location and arrangement (room necessary for an optometric clinic, furniture arrangements,
visual privacy, sound privacy, Instrumentation, etc.)
5.0 Public Health Optometry
5.1 Epidemiology
5.2 Definition of Terms in Public Health
5.3 Government health care programs (health planning, health education)
5.4 Community Health Projects
5.5 Vision Care Delivery (occupational safety and health acts)

PRACTICAL EXAMINATION

I. Objective Examination

The determination of the refractive status and ocular condition of the patient without questioning him. This covers
external ocular examination, motility test, rotation tests, and fixation test), ophthalmoscopy (indirect and direct), opthalmometry, biomicroscopy, autoretraction and retinoscopy.

II. Subjective Examination

As a series of tests designed to determine the refractive status power of accommodation and convergence, the relationship of accommodation and convergence, quality of fusion and stereopsis based on the patients responses.
This covers case history, visual acuity, dominancy tests, color vision test, projection tests, visual field charting, OEP
techniques except step nos. 1, 2, 4, 5 and 6, fusion tests, stereoscopic tests, analysis and prescriptions, uses of the
trial case, contact lens fitting and assessment.

III. Ophthalmic Mechanics

Laboratory exercises in edging, mounting, insertion and glazing, neutralization, surfacing, lens lay out, frame adjustments, transportation (optical cross, toric and flat), and filling prescriptions.

IV. Diagnostic Instruments Required

1. Objective Examination Retinoscope and ophthalmoscope set, penlight, P.D. rule, occuder, trial case (which includes occluder, pinhole disc, red and green filter, stenopaic slit, trial frame)

2. Subjective Examination Trial case (which includes occluder, pinhole disc, red and green filter, stenopaic slit, trial frame), P.D. rule and penlight, nearpoint charts (cross grid, 0.62 em target, reduced snellen), occluder, pinhole, hand towel for contact lens patients, soft and hard contact lens.

3. Ophthalmic Mechanics Trial case, P.D. rule, one pair finish lens (plastic and glass, cylindrical and spherical), one pair rough lens (glass), one spectacle frame, protractor, long nose pliers, chipping pliers, screwdriver set, lens pattern materials (scissors, cardboard, pens).