Syllabus for Licensing Examination of PCL in Ophthalmic Science/Diploma in Ophthalmic Technique
2021

Nepal Health Professional Council
Bansbari, Kathmandu
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1. **Basic of preparatory/general sciences (Physics biochemistry, zoology, Botany)**

   This includes essential knowledge
   - Laws of reflection and refraction, Refractive index
   - Types of chemical bond.
   - Characteristics of acids, bases and salts.
   - Antacids and antabases and their medical uses
   - Structure (Linear Cyclic) of glucose,
   - Functions of Carbohydrates
   - Introduction of lipid, fat and oil and their natural sources.
   - types of tissues
   - muscular tissue and its types, striated, smooth and cardiac muscles of animals.
   - Nervous tissue and its types.
   - Morphology of fungal plant
   - Characteristics of a virus

2. **General Anatomy and Physiology (Systems of the Body)**

   This includes general concepts of anatomy and physiology of human body:
   - Anatomical terms,
   - Accessory organs and glands of the skin.
   - Structures and functions of the heart, Components and function of the blood.
   - Terms related to the skeletal system: axial ,appendicular ,articular cartilage ,diaphysis, epiphysis fontanel , hematopoiesis , periosteum
   - Classifications of joints,
   - structure and Divisions of the central nervous system:Classifications of neurons and neuralgia
   - self-healing nature of body cells and tissues.
   - Physiological terms: Cardiovascular, Digestion ,Excretion ,Organ ,Peritoneal ,Pericardial ,Thoracic Visceral ,Homeostasis
   - Cranial nerves and their function
   - Measurement of pulse and blood pressure

3. **Ocular Anatomy and Physiology**

   This includes general concepts of basic knowledge of the anatomy and physiology of the eye. This includes:
   - Embryology of the eye
   - Anatomy along with blood and nerve supply of eye lids and adnexa, conjunctiva, cornea, sclera, uveal tract, lens, vitreous humor, retina, angle structure
Physiology of the cornea, aqueous humour, metabolism of cornea, lens and vitreous
Anatomy of orbit and its walls
Anatomy of extraocular muscles
Anatomy and functions of cranial nerves related to eye
Anatomy of lacrimal drainage systems
Formation and drainage of aqueous humour
Anatomy and physiology of visual pathway
Anatomy of pupillary pathway and pupillary reflex

4. **Ocular Pharmacology**

This includes concepts on pharmacology with special reference to eye. Selection of appropriate drugs for specific disease/conditions, their actions, indications, contraindications and side effects.

This includes

- Pharmacological terminologies like half life, plasma concentration of drug, bioavailability, shelf life, expiry date
- Concepts of pharmacodynamics, pharmacokinetics
- Routes of administration of drugs
- Mechanism of action, indication, contraindication, side effects precautions of:
  - Different types of antibiotics, their mechanism of action and spectrum of activity
  - Drugs used in gastrointestinal systems, respiratory system, cardiovascular system, Central Nervous System
  - Analgesic, antipyretic and anti-inflammatory drugs: Mechanism of action, indication, contraindication, side effects and precautions
  - Steroidal drugs
  - Nutritional Supplements
  - Antihistamines and allergic
  - Mydriatics and Cycloplegics
  - Miotics and Antiglaucoma drugs
  - Lubricating drugs

5. **Ocular Pathology**

This includes different aspects of ocular pathology with special reference to eye.

Includes:

- Microbiology
  - Morphology, classification, structure of bacteria, virus, fungus, parasites
  - Epidemiology, mode of infection, pathogenicity, laboratory diagnosis of common bacteria, virus, fungus, parasites
  - Culture media of bacteria, fungus
  - Different staining techniques, antibiotic susceptibility testing
General composition of blood, types of blood cells with their function
Total Leucocyte count, Differential Leucocyte count with their normal values
Different methods of sterilization and disinfection

6. **Systemic Disease of the eye**

This includes ideas of disease in general medicine related to the eyes

This includes:
- Diabetes Mellitus and its effects on eye
- Hypertension and its effects on eye
- Thyroid Eye Disease and its effects on eye
- Vitamin A deficiency and its effects on eye
- Tuberculosis
- Leprosy
- Syphilis
- Gonorrhea
- Rubella
- Toxoplasmosis
- HIV/AIDS

7. **Binocular Single Vision and its abnormalities**

This includes identification and management of different binocular vision abnormalities.

This includes:
- Understand the function of EOM
- Different types of eye movement
- Accommodation: Introduction, anomalies and assessment
- Latent and Manifest misalignment of the eyes
- Motor and Sensory adaptation to strabismus

Basic Tests in Orthoptics setting
- Hirschberg and Krimsky test
- Cover test and its types
- Test of convergence and accommodative problems
- Test for suppression
- Test for stereopsis
- Test for Prism Fusion range

Amblyopia and its management

8. **Optics and Refraction**

This includes basic knowledge of optics and refraction, understanding of the light and its clinical implications, different optical condition of the eye. This includes

- Light, its nature and interaction with reflective and refractive medium
- Cardinal points
Schematic Eye
Lens design options in minus and plus lens
Meniscus lens, Lenticular lens and Myodisc
Manufacturing of Ophthalmic lenses
Properties of Ophthalmic lens
Lens aberrations
Myopia and its classification based on etiology
Hyperopia and classification based on etiology
Astigmatism and types of astigmatism
Accommodation and its physiology
Presbyopia and its classification
Parts of retinoscope, optical principle, reflex characteristics and procedure
Techniques of subjective refraction and its importance
Specifying lens power, prescription writing and power verification

9. Investigative Ophthalmology
   This includes different investigation procedures for specific eye problems and interpretation the findings of the investigations. This includes
   Visual acuity (near and distance)
   Colour vision and contrast sensitivity assessment
   Intraocular pressure
   Visual field
   Ultrasonography
   FFA
   Anterior segment and fundus photography
   Exophthalmometry
   Pachymetry
   Keratometry
   Gonioscopy
   Direct Ophthalmoscopy
   Indirect Ophthalmoscopy
   Slit lamp bio microscopy
   Biometry

10. Ophthalmic Nursing Care and Operation Theatre Management
    This includes basic ophthalmic nursing procedure required to perform during, after and before surgery. This includes
    Respiration: definition, types, characteristics, factors affecting temperature, pulse, respiration and blood pressure
Principles, Techniques and Measurement of temperature, pulse, respiration and blood pressure
Objective of Operation Theatre
Operation Theatre management and aseptic technique
Trolley preparation in different eye surgery
Scrub and circulation
OT Hazards and risk management
Definition, types of ocular anesthesia, equipment
Management of recovery patient
Pre and post operative management of different types of ocular surgery
Routes of administration of drugs

11. **Ocular Surgery Assisting**

This includes knowledge and skills on ocular surgical procedures to assist the ophthalmologist. Includes:

- Instruments, step, consumable and medicines in
  - cataract surgery
  - glaucoma surgery
  - nasolacrimal passage surgery
  - Strabismus surgery
  - Keratoplasty surgery
  - Vitro-retinal surgery
  - Lid surgery
  - Orbitotomy surgery
  - Enucleation, evisceration and extentration surgery
  - Excisional biopsy
  - Electroepilation
  - Pterygium excision and conjunctival graft

- Preparation of patient, surgical area, step of surgery, possible complication and management of extra ocular surgeries
- Trolley preparation, consumable and post operative management of
  - Entropion
  - Chalazion
  - lid laceration repair
  - incision and drainage of lid abscess and externum

12. **Community Ophthalmology**

This includes planning, implementing, monitoring and evaluating the eye health and interventions in defined population. Developing tools to assess the magnitude of eye problem, calculating disease burden and making conversation with current national and
global eye health strategies and planning on eye health. This includes
  Concept of health given by Alma-Ata declaration/WHO
  Primary health care, its definition and elements
  Measuring disease burden in community (Magnitude, prevalence, incidence)
  Concepts, Importance, Components of community participation
  Health/Eye health status indicators
  Basic Health profile of Nepal
  Prevalence of blindness and visual impairment in Nepal
  Calculation of WHO standard of visual outcome
  Sustainable Development Goals
  WHO action Plan
  WHO and IAPB eye health strategies at global and regional level

13. **Code of Ethics**