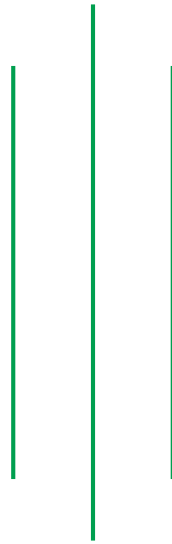


# **Syllabus for Licensing Examination of B.Sc. Medical Biochemistry 2021**



**Nepal Health Professional Council**  
Bansbari, Kathmandu

## Table of Content

SN	TOPIC	Marks
1	Clinical Biochemistry- General	15%
2	Clinical Biochemistry- Analytical	5%
3	Clinical Biochemistry- Diagnostic	15%
4	Clinical Biochemistry- Lab Management	5%
5	Clinical Biochemistry- Instrumentation	5%
6	Biomolecules	5%
7	Metabolism	15%
8	Enzymology	5%
9	Bioenergetics	5%
10	Molecular Biology	15%
11	Nutritional Biochemistry	5%
12	Immunology	5%
<b>Total</b>		<b>100%</b>

## SN 1: Clinical Biochemistry- General

- General Principles of clinical Biochemistry and its role in Medicine.
- Characteristic features, metabolism, disorders, functional test of Kidney, Liver, Heart, Brain, Pancreas, Gastrointestinal system
- Sodium , Potassium, Acid- Base Physiology
- Muscles, Iron, Calcium and Phosphorus Metabolism
- Inherited metabolic disorders: ( Aminoaciduria, Cystinosis, Cystinuria, Galectosemia, Fructosemia, Phenylketonuria, Tyrosinuria
- Endocrinology: Introduction, Functions, regulation, disorders, biochemical Investigations of Hypothalamic Pituitary Hormone, Adrenal Hormone, Steroid Hormone, Thyroid Hormone, Pancreatic Hormone
- Tumor Marker: Introduction, Chemical carcinogens and their mechanism of action, clinical application, specific tumor markers tests.

## SN 2: Clinical Biochemistry- Analytical

- Introduction, Principles and Application of Basic Analytical Techniques used in biochemical investigation ( Immunochemical Techniques, spectroscopic techniques, Mass spectrometric Techniques, Radioisotopes techniques, Centrifugation techniques, Electrochemical techniques, Chromatography Techniques.

## SN 3: Clinical Biochemistry- Diagnostic

- Collection and transportation of clinical specimen for Biochemical study.
- Different analytical methods used in diagnostic Biochemistry.
- Principle, Procedure and interpretation: ( Renal Function Test, Liver function Test, Cardiac Function Test, Pancreas Function Test)
- Minerals and Electrolyte test ( Calcium, Phosphorus, Sodium, Potassium, Iron, Magnesium), Blood Gas Analysis:  $pO_2$ ,  $pCO_2$
- Hormone Analysis (Thyroid Hormone, Steroid Hormone, Glucocorticoids, Mineralocorticoids,  $\beta$ -HCG)
- Analysis, report and interpretation of Urine test (Physical, Chemical and Microscopical ) and Blood biochemical parameters (Glucose, Cholesterol, Urea, Creatinine, Bilirubin, Total Protein, Albumin, Globulin, Uric Acid, Amylase, Lipase) .

## SN 4: Clinical Biochemistry- Lab Management

- Introduction of Lab Management and Organisation
- Calibration and Quality control of instrument used in clinical biochemistry lab
- Rule and regulation in the lab.
- QCA (Quality control Assessment): External and Internal Quality control.
- National and international guideline of Waste Disposal system

## SN 5: Clinical Biochemistry- Instrumentation

- Introduction, Principle, operation and care diagnostic importance of Biomedical Instruments ( Colorimeter, spectrophotometer, Flame photometer, Centrifuge machines, distillation, Electrophoresis, Auto analyser, Blood Gas Analyser, Micro Cell Counter, Flow Cytometer, Chromatography set, Analytical Balance, Immune Fluorescence devices.
- Electrical and Other hazard, safety, standards
- Maintenance of equipment

## **SN 6: Biomolecules**

- Cell (introduction, growth, organisation, adhesion, junction, functions)
- Biological Membrane and Transport
- Definition, Classification, source, structure, properties, biomedical importance and tests of Carbohydrates, Amino acid and Protein, lipids, Nucleic acids
- Protein Purification by different methods

## **SN 7: Metabolism**

- Digestion, absorption, metabolism, regulation and metabolic disorders of Biomolecules (Carbohydrates, Amino acids and Proteins, lipids)
- Metabolism of Haemoglobin, Nucleic acid, Purine and Pyrimidine

## **SN 8: Enzymology**

- Introduction, Definition, Classification, biological function, sources of Enzymes.
- Factors affecting Enzyme activity
- Enzyme kinetics and Inhibition
- Regulation of Enzyme
- Enzyme Assay
- Enzyme, Iso enzyme, Co-enzyme and its clinical significance
- Enzyme Extraction and Purification.

## **SN 9: Bioenergetics**

- Introduction
- Metabolism
- Types of Reaction of living cells
- High energy phosphate Compounds
- Biological Oxidation
- Respiratory Chain and Oxidative Phosphorylation

## **SN 10: Molecular Biology**

- Introduction
- Regulation of Gene Expression
- Transcription
- Protein synthesis
- Regulating: The Lac-Operan system, catabolic repression, The Trp Operon system, Plasmid
- Gene Cloning and Recombinant DNA Technology
- Mutations
- Genetic Mapping

## **SN 11: Nutritional Biochemistry**

- Introduction
- Macronutrients
- Minerals and its importance
- Ultra-Trace elements and importance (Nickel, Silicon, Vanadium, Arsenic, Boron, Cobalt)
- Homeostatic maintenance of Nutrition
- Vitamins

## SN 12: Immunology

- Introduction
- Antigen and Antibody
- Compliment system
- Hypersensitivity Reactions
- Immune Tolerance and auto immunity
- immune deficiency disease
- Clinical Immunology