

## **Syllabus for Entrance test in Clinical Biochemistry 2021**

**Note:** The syllabus Prescribed for the entrance test has been divided into fifteen units. Each unit carries a weightage of four marks. Paper setters are required to set four multiple choice type questions with only one correct or most appropriate answer separately for each unit, giving uniform representation to the whole syllabus contained therein.

### **Unit I**

Chemical Bonding & Molecular Structure, Oxidation-reduction, Redox potential, coupled reactions, Elimination, Isomerization and rearrangements. Dipole-dipole interactions, Hydrogen bonds, vanderwaals forces, concept of acids and bases. Electrophiles and nucleophiles. Chemical kinetics and catalysis; orders of reactions, concepts of activation energy and reaction rates, laws of photochemistry, photochemical reactions. Laws of thermodynamics.

### **Unit II**

Structure and Function of Carbohydrates, Lipids, Vitamins, Nucleic acids, Amino acids and Proteins.

### **Unit III**

Enzymes: General characteristics, nomenclature and classification of enzymes, enzyme activity and factors affecting enzyme activity, enzyme kinetics, enzyme Regulation.

### **Unit IV**

Synthesis and degradation of Carbohydrates, Lipids, Amino acids and Nucleic acids. Units of energy, BMR and its measurement, Protein energy malnutrition metabolism related disorders (PKU, Tyrosinemia).

### **UNIT V**

Morphology of Prokaryotic and Eukaryotic cells. Structure and function of cell organelles (ER, Golgi, Nuclers, Mitochondria and Peroxisomes). Cell Cycle, Cell Membrane structure & function, Membrane Transport.

### **UNIT VI**

Central dogma of molecular biology, Structural organization of DNA and RNA. Replication, Transcription and Translation in prokaryotes and eukaryotes.

### **UNIT VII**

Introduction to Microbial Systems, Structure, Classification of viruses and bacteria. Virulence and pathogenesis. Host parasite relationship. Antimicrobial agents.

### **UNIT VIII**

History, scope and significance of immunology, Basic concepts of specific and Non-specific immune responses. Structure and function of Immunoglobulins. Antigen-Antibody interactions. Immunodeficiency disorders.

## **UNIT IX**

Mendelian Genetics; laws and principles of segregation, independent assortment. Linkage and Crossing over. Chromosome organization: Structural and Numerical changes in Chromosomes.

## **UNIT X**

Concept and application of Gene Cloning and recombinant DNA technology (RDT). Applications of genetic engineering in medical and agricultural sciences. Plasmids (Ti & Ri Plasmids of Agrobacterium), Transposons (Ac & Ds of Maize). Gene transfer techniques in plants, transgenic plants with special reference to Bt-Cotton & Golden rice.

## **UNIT XI**

Applications of Clinical Biochemistry. Kidney, Liver and thyroid function tests (KFT, LFT, and TFT). Lipid profile. Glucose tolerance tests. Urine and stool examination.

## **UNIT XII**

Cell Injury – types and Morphology, Inflammation, Components and functions of blood and lymph. Blood coagulation. Anemia Inflammation, Mediator's of Inflammation, Acute and Chronic Inflammation, Circulatory disturbances – Thrombosis, Infarction. Edema, Shock- definition and pathogenesis.

## **UNIT XIII**

General organization and physiological functions and disorders of Respiratory, Excretory, Digestive and Endocrine system.

## **UNIT XIV**

Centrifugation: Basic principles and its types, Spectroscopy- Principles and application of spectrophotometry & Fluorescence spectroscopy, Electrophoresis & Chromatography- Principle, Instrumentation & applications of PAGE, IEF. Types & basic principles of Column & Thin layer Chromatography.

## **UNIT XV**

Photosynthesis- Light harvesting complexes, C3 & C4 pathway, Mechanisms of electron transport; photoprotective mechanisms. Nitrogen metabolism- Biological nitrogen fixation & assimilation. Plant hormones-Biosynthesis, storage, breakdown and transport; physiological effects and mechanisms of action.

In-charge Admission

Coordinator