

# Bio-Chemistry

## DEGREE STANDARD

### Unit-1-Biomolecules

Carbohydrates- Classification, Structure- Reactions-Oligosaccharides - Polysaccharides-Structural Polysaccharides-Lipids-Classification-Simple compound -Derived-biomembranes- Amino acids- Classification-reactions-peptides-Primary structures-Glutathione, Oxytocin -vasopressin-Proteins- Classification- Properties-Structure-Myoglobin & hemoglobin-Vitamins-Fat soluble-water soluble- Sources-structure-physiological functions

### Unit-II Techniques

pH scale-Buffer solutions, buffer systems of blood, -Chromatography-principle, materials, methods and applications: - Paper chromatography, TLC, GLC, Adsorption, ion exchange, affinity chromatography and molecular sieve: principle of HPLC, Molecular weight determination by molecular sieve method. Electrophoresis-Ultracentrifuge-Separation of Cell organelles-Colorimetry-Spectrophotometry-Fluorimetry-Flame photometer-Tracer-Techniques-Applications of radioisotopes in biological sciences- Radioisotopes in medical sciences.

### Unit-III- Enzymes

Enzymes- six main classes- Catalysis-Extraction, purification and characterization of enzyme kinetics- Enzyme-inhibition-Ribozymes-Isozymes-Coenzymes-Multienzyme complex. Mechanism of enzyme action-immobilized enzymes.

### Unit-IV- Intermediary Metabolism

Bioenergetics-high energy compounds-free energy of hydrolysis-Glycolysis-TCA cycle-Gluconeogenesis-Glycogenesis-Pentose Phosphate pathway-Electron transport chain-Oxidative phosphorylation- Oxidation of fatty acids-beta oxidation-alpha oxidation-omega oxidation-Biosynthesis of-fatty acids and Cholesterol-Catabolism of amino acid-Oxidative deamination-transamination-decarboxylation- Metabolism of Purines-Pyrimidines.

### Unit-V- Physiology

Digestive system-Respiratory system-Blood-Body fluids-Nervous system-propagation of nerve impulse synaptic transmission-Neurotransmitters-Myosin and Actin and regulatory proteins-mechanism of contraction-Structure of nephron-renal regulation-Spermatogenesis-menstrual cycle-Pregnancy and lactation-steroid and glycoprotein-hormones-second messenger concept-CAMP.

### Unit - VI - Molecular Biology

Bacterial transformation-transduction and conjugation-DNA replication in prokaryotes-eukaryotic replication-Prokaryotic transcription-Initiation, elongation and termination -Eukaryotic gene-nucleosomes-transcription factors-Processing of mRNA-Reverse transcription-Genetic code-tRNA- Translation-Protein synthesis in prokaryotes.-Recombination-DNA repair mechanism-Excision repair-gene regulation-gene mutation-reversion-Bacterial transposons.

### Unit-VII - Immunology

Antibody mediated-Cell mediated response-lymphoid organs-neutrophils-macrophages-phagocytosis-Antigens -antigenic determinants-haptans-Classes of Immunoglobulins-Antigen-antibody interactions in-vivo-complement component-Immuno electrophoresis-Cytokines.

#### Unit-VIII- Clinical Biochemistry

Diabetes mellitus-blood sugar GTT-Complications of diabetes-mellitus-Plasma lipids-hyperlipoproteinemia-Type I, II, III, IV, and V-lipoproteinemia-atherosclerosis-Hypercholesterolemia-tests of gastric function-Liver function tests-jaundice-Serum enzymes in liver disease-(SGPT) & SGOT)-Kidney function tests-creatinine and urea-Clearance.

#### Unit-IX - Animal and Plant Cell Biotechnology

Plant Tissue Culture-Micropropagation-Gene transfer in plants-Ti Plasmid vectors-Protoplast fusion-Transgenic plants-Pest resistance-Mammalian cell culture- Cell-lines-Suspension culture; immobilized-cultivation-Gene transfer into mammalian cells-vectors; in vitro fertilization (IVF); embryo cloning.

#### Unit-X - Plant Bio-chemistry

Plant Cell- Cell wall-Organelles-Transport mechanisms-Absorption-Translocation of Water-Transpiration-Photosynthesis- Pigments-light absorption- Photosystem-I-Photosystem-II-Calvin's cycle (C3-Plants).- (C4 Plants)-Photorespiration-Nitrogen cycle-Nitrogen fixation.