

BIOMOLECULES

Unit 1

Carbohydrates: Classification and structural elucidation of glucose and fructose. Interconversion of sugars. Properties, structure and biological functions of mono, di, oligo and polysaccharides. Homoglycans and Heteroglycans. Blood group polysaccharides.

Unit 2

Amino acids: Structure, classification, physical and chemical properties. Titration curves of amino acids. Colour reactions of Amino acids. Peptides: Amides and peptides, peptide bond, peptide synthesis, biologically important peptides.

Proteins: classification and Biological importance. Primary structure, Secondary, tertiary and quaternary structure- forces stabilizing the structure of proteins. Denaturation, isolation and characterization. Precipitation by salts, separation by solubility differences- isoelectric pH, salting out. Purification of proteins.

Unit 3

Nucleic acids: Components of mono nucleotides, pyrimidines and purines. Nucleotides, nucleosides, nucleoside 5' diphosphates and 5' triphosphates. Polynucleotides: DNA and RNA. Composition and structure- their biological importance hydrolysis of nucleic acids by acids, bases and enzymes. Denaturation and renaturation. Isolation, separation and purification of DNA and RNA.

Unit 4

Lipids: nomenclature, classification and Biological significance. Simple lipids: types of fatty acids, triglycerides, waxes, steroids, prostaglandins and their properties. Compound lipids: Phospholipids, sphingolipids and glycolipids. Lipoproteins. Analysis of oils: Reichert-Meisel value, Iodine number, saponification value, acid number and acetyl value.

Unit 5

Vitamins. Source, structure, biological role, daily requirement and deficiency manifestation of the fat soluble vitamins A,D,E & K. Water soluble vitamins- Ascorbic acid, thiamine, riboflavin, pyridoxine, niacin, pantothenic acid, lipoic acid, biotin, folic acid and vitamin B₁₂.

References

1. Principles of Biochemistry – Lehninger
2. Textbook of Biochemistry-West & Todd.
3. Harper's Biochemistry 25th edn, Mc Graw Hill.
4. Fundamentals of Biochemistry – O.P. Agarwal.
5. Essentials of Biochemistry – M.C. Pant.
6. Essentials of Biochemistry – A.I. Jain.