MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

B. Sc. BIOTECHNOLOGY I YEAR TDC (2016-17)

Paper V : *Fundamentals of Biochemistry*

Unit-I

Nature of biological material, Identifying characteristics of living matter, Molecular logic of life, Bioelements, General properties of biomolecules, Central role of carbon, Water : structure and unique properties, Acid, Base, Buffers, Polyprotic acids. Principles of oxidation- reduction, bonding and structure, type of bonds, bonding and reactivity in inorganic and organic molecules, covalent bonds. Potential and redox potential, high energy bonds and high energy compounds.

15 Credit hours

Unit II

Monosaccharides : Classification, configuration, conformation and derivatives, Common Disaccharides, Structure and occurrence of storage and structural polysaccharides, Glycosaminoglycans, Glycoprotein: structure and function.

15 Credit hours

Unit III

Fatty acids, Triacylglycerol, Glycerophospholipids, Sphingolipids: Sphingomyelins, cerebrosides and gangliosides, Cholesterol, Micelles, Bilayers, Liposomes, Lipoprotein structure and function. Glycogen synthesis and degradation, fatty acid biosynthesis.

15 Credit hours

Unit IV

Amino acids: Structure, nomenclature and general properties, Peptide bond, Primary structure of proteins: end group analysis, amino acid composition, specific peptide cleavage and sequence determination, Secondary structure: peptide group, Ramachandran diagram, Helical structures: alpha-helix and other polypeptide helices, Beta-pleated sheets, Protein stability: Electrostatic interactions, Hydrogen bond and Hydrophobic forces, Disulphide bond, General idea of tertiary and quaternary structure of proteins.

15 Credit hours

Unit V

Vitamins of B-group : their coenzyme forms, recommended dietary allowance (RDA), source and biochemical function. Fat soluble vitamins: RDA, sources and function. Enzymes: historical perspective, naming and classification, enzyme units, specificity and stereospecificity, Enzyme kinetics: Michaelis-Menten equation and its transformations. Mechanism of enzymes action and its regulation.

15 Credit hours

Recommended Books

1. Voet and Voet. 2000. Biochemistry. John Wiley.
2. Lehninger. 2000. Principles of Biochemistry. CBS Publishers.
3. Stryer, L. 2002. Biochemistry. W.H. Freeman.
4. Harper. 2003. Biochemistry. McGraw-Hill.
5. Zubay. 1995. Biochemistry. Brown Publishers.
6. Trehan, K. Biochemistry. Wiley Eastern Publications.
7. Jain, J.L. Fundamentals of Biochemistry. S. Chand and Company.
8. Deb, A.C. Fundamental of Biochemistry.
9. Methew, C.K. Biochemistry. Pearson Education.