BTY105:FUNDAMENTALS OF BIOCHEMISTRY

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: describe the fundamental principles of biophysical and carbohydrate chemistry

CO2 :: understand the structure and function relationship of various types of lipids in living system

CO3 :: interpret the basic structure and functions of nucleic acids along with their physical, chemical and biological properties

CO4 :: analyze amino acids responsible for versatile and diversified nature of proteins

CO5 :: evaluate the role of biological catalyst along with their types and mechanism of action

CO6 :: appraise the fundamental reactions of metabolism for energy production and biosynthesis of biomolecules

Unit I

Acid, Base and Buffers : properties of water, concept of pH scale, buffers and its mechanism of action, Henderson Hasselbalch equation

Carbohydrates : classification of carbohydrates, monosaccharides, stereo isomerism of monosaccharides, sugar derivatives, oligosaccharides, polysaccharides (storage and structural), mucopolysaccharides

Unit II

Lipids : fatty acids structure and function, essential fatty acids, tri-acyl glycerol, phospholipids, sphingolipids, glycolipids, cholesterol, eicosanoids, function of lipids

Unit III

Nucleic acids : purines and pyrimidines, nucleosides & nucleotides, biologically important nucleotides, structure of DNA, structure of RNA, physical and chemical properties of nucleic acids

Unit IV

Amino Acids and Proteins : structure and properties of amino acids, classification of amino acids, titration curves of amino acids, structure and functions of proteins, different level of structural organization of proteins, denaturation and renaturation of proteins

Unit V

Enzymes, Vitamins & Minerals : mechanisms of enzymes action, nomenclature and classification of enzymes, factors affecting enzyme activity, enzyme kinetics, overview of enzyme inhibition, introduction to vitamins and minerals

Unit VI

Metabolism : bioenergetics, glycolysis and its regulation, TCA cycle and its regulation, pentose phosphate pathway and its significance, electron transport chain and oxidative phosphorylation, ß-oxidation of fatty acids, synthesis of fatty acids

Text Books:

1. FUNDAMENTALS OF BIOCHEMISTRY by SUNJAY JAIN, J L JAIN, NITIN JAIN, S Chand Publishing

References:

1. BIOCHEMISTRY by U SATYANARAYAN U CHAKRAPANI, ELSEVIER