

Principle paper BT 101 Biochemistry

Section I

Unit 1

- 1.1. Principles of thermodynamics and bioenergetics
- 1.2. How Enzymes do Work?; Types of enzyme catalyzed mechanisms -example of chymotrypsin, Carbonic anhydrase, Ribonuclease A, DNA polymerase.
- 1.3. Enzyme Kinetics as an Approach to Mechanism; Enzyme inhibition; Examples of Enzymatic Reactions.
- 1.4. Regulation of enzyme catalyzed reaction, Regulatory Enzymes; Multi enzyme reaction.

Unit 2

- 2.1. Carbohydrate metabolism:: Introduction to Carbohydrates, Glycolysis, TCA Cycle, Gluconeogenesis, Glycogen Metabolism, Metabolism of Monosaccharides and Disaccharides, PPP Pathway and NADPH.
- 2.2. Lipids: Types, structure and functions
- 2.3. Lipid Metabolism :Metabolism of Dietary Lipids, Fatty Acid and Triacylglycerol metabolism.
- 2.4. Complex lipid metabolism, Cholesterol and steroid metabolism.

Section II

Unit 3

- 3.1. Amino acid : type and chemical properties. Proteins: primary, secondary, tertiary and quaternary structure of proteins. Folding of proteins and protein degradation.
- 3.2. Allosteric regulation of proteins: hemoglobin, protein degradation.
- 3.3. Amino acid metabolism: biosynthesis and degradation, disposal of nitrogen
- 3.4. Nucleotide metabolism: Biosynthesis and catabolism of purines and pyrimidines

Unit 4

- 4.1. Concepts of redox potential, Oxidative phosphorylation in mitochondria and prokaryotes.
- 4.2. Photophosphorylation and carbohydrate synthesis in plants and bacteria.
- 4.3. Integration of Metabolism: Metabolic Effects of Insulin and Glucagon, The Feed/Fast Cycle, Diabetes Mellitus, Obesity.
- 4.4. Over view of metabolic disorders, Role of vitamins.

References

1. Lehninger, Principles of Biochemistry
2. Stryer, Biochemistry
3. Voet and Voet, Biochemistry
4. Nicholes, Fundamentals of Enzymology
5. Trevor Palmer, Understanding Enzymes