Subject Code : P8GT2

CORE COURSE II– BIOLOGICAL CHEMISTRY

Unit I

Biomolecules – chemical composition and bonding, properties of water, acids, gases and buffer – Carbohydrates – Structure and classification of moon di and polysaccharides, Glycolysis – Kreb's cycle – Gluconeogenesis – HMP pathway

Unit II

Protein – Classification and Properties – four levels of protein structure & conformations, Ramachandran Plot, Structural categories of proteins. Relationship between structure and function, Properties, Bio synthesis, Properties and Metabolism of amino acids.

Unit III

Lipids – Classification – Structure – Properties – Lipid metabolism – Oxidation – Fatty acid and cholesterol Biosynthesis – Glyoxalate cycle, Vitamins – Classification, Derivatives – Secondary metabolites from plants – Functions, Hormones – Types, functions and disorders.

Unit IV

Enzymes – Nomenclature, Classification, Properties, Structure – function relationship of enzymes, Extradition, purification and assay methods of enzymes, Enzyme turnover, Enzyme specificity – enzyme – substrate complex, Factors affecting enzyme action – Metals & cofactors – Proximity, orientation – distortion or strain, Mechanism of enzyme action: chymotrypsin, DNA polymerase, Lysozyme and carboxy petidate. Catalytic RNA

Unit V

Kinetics of enzyme – catalyzed reactions – One substrate and two substrate kinetics, steady-state kinetics – Multisubstrate kinetics – Michaelis – Menten, Line Weaver, burke, Ping=pong, Dixon plot, Enzyme inhibition – type of inhibition, Competitive, no competitive and uncompetitive kinetics. Introduction to enzyme regulation, allosteric enzymes and their significance & cooperative interactions, Activation of enzyme , coenzyme their role and regeneration, Isozymes-lactate dehydro genase. Multi enzyme system: Pyruvate dehydro genase – Polygenic nature, Immobilized enzymes, Application of enzymes in various fields. Enzyme engineering, Enzyme therapy.

Text Book:

1. Stryer.L. (2003) Biochemistry, V. Edition. W.H. Freeman & Co. NY

Reference Book:

1. Michael Cox., David. L. Nelson, (2004) Lehninger, Principles of Biochemistry, Kalyani Publishers, New Delhi.

2. Geofrey L. Zubay, William W. Passon, Dennis L. Vance, (1988), Principles of Biochemistry, IV edition, W. M. C. Brown Publishers, Australia
3. Murray, R.K. A. Grannor, D.K. Mayes, P.A. and Rodwell V. W. (2000) Harper's Biochemistry, McGraw Hill Pvt. Ltd., New Delhi
4. Sober, (2002), Handbook of Biochemistry selected Data for Molecular Biology, II. Edition
5. Arthur M. Lest, (2002), Introduction to Protein Architecture, The Structural Biology of Proteins, Oxford University Press
6. Gregory A. Petsko, Dagmar Ringe, (2003) Protein structure and function (Printers in Biology) Siauer Associates
7. Nicholes C. Price and Lewis Stevens, (2001), Fundamentals of Enzymology, The cell and molecular Biology of catalytic proteins, Oxford University Press.
8. Allan Fershi, (1984), Enzyme structure and mechanism. 2 Rev. Ed. Edition W.H. Freeman & Co. Ltd., USA
9. Trevor Palmer, (1985), Understanding Enzymes, 2 Rev. Ed., Edition Ellis, Horwood
10. K.J. Llaider and Bunting P.S. (1973) The chemical kinetics of Enzyme action, 2 Rev, Ed. Edition, Oxford University Press, London
11.Dixon and Webb, (1964) Enzymes, Longman
12.Trehan. K. (1994) Introduction to Biotechnology, Niley Eastern, New Delhi