

ELECTIVE II – ENZYMOLOGY

Unit I

Classification, nomenclature & general properties, Factors, affecting enzyme action pH, temp, ions, substrate concentration, enzyme concentration, inhibitors, Extraction, assay and purification of enzymes units of activity and kinetics of enzyme catalysed reactions – the transition state.

Unit II

Steady state kinetics – bisubstrate and multisubstrate reaction – enzyme catalysed reaction – different types of inhibitors and activators – Michaelis-Menton, Lineweaver and Burke equations, K_m , K_{cat} and K_i value Enzyme specificity – absolute and rigid specificity, Nucleophilic & electrophilic attack

Unit III

Role of co-enzyme in enzyme catalysis: Co-enzyme regeneration, Mechanism of enzyme action eg., lysozyme, chymotrypsin, DNA polymerase, ribonuclease & LDH, zymogen & enzyme activation, allosteric enzymes & metabolic regulations. Clinical & industrial uses of enzymes.

Unit IV

Techniques of enzyme immobilization & their applications – medical, food, leather, textile and paper industries. A brief account of modification of enzymes (enzyme engineering) and its products through r-DNA technology. Biosensors, Mechanism of light activation of enzymes.

Unit V

Industrial utilization of enzymes, practical aspects of large-scale protein purification, use of soluble enzymes, enzyme reactors, membrane reactors, continuous flow, packed bed reactors, large-scale application of microbial enzymes in food and allied industries. Antibiotics production, medical application of enzymes in reverse glycosidase synthetic reaction. Interesterification of lipids, Enzyme therapy.

Books for Reference:

1. Blazej, A. & Zemek.J. 1987: Interbiotech, 87, Enzyme Technologies, Elsevier
2. Murray Moo – Young 1988 Bioreactor immobilized enzyme and cells. Fundamentals and applications, Elsevier, Applied Science
3. Rehm, H.J. and Reed G. 1988, Biotechnology, Vol 7a, Enzyme Technology, Elsevier
4. Terrance G. Cooper 1977 The tools of Biopchemistry, John Wiley & Son
5. William, b. Jakoby, 1984 Methods in Enzymology, Vol.104, enzyme purification and related techniques.