PAPER III
THERMODYNAMICS, MEMBRANE BIOPHYSICS & BIOSTATISTICS

MM 75

Thermodynamics, Membrane Biophysics

Law of Thermodynamics and its application to biological systems: First law of Thermodynamics, Heat of Formation & Heat of reaction. Second law of Thermodynamics, molecular basis of entropy, Helmholtz and Gibbs free energy.

Types of cells, electrodes, oxidation –reduction reaction, standard electrode potential and its determination, measurement of ΔG. Electron transfer measures and phosphate group transfer potentials. Coupled reactions and simultaneous equilibria.

Membrane and membrane transport (Fluid Mosaic model, uniport, symport, antiport, active and passive transport).

Biostatistics

Collection of data, Primary and Secondary data, classification and tabulation of data
Measures of central tendency; Measures of dispersion, Methods of sampling- sampling theory & test of significance (definition of random sampling, simple random sampling, systematic & stratified sampling and confidence level for those sample statistics)

Correlation coefficient, Regression analysis; Probability (theorem on total probability of two events, definition of conditional probability with some elementary problems), Distribution- definition properties and uses of Bernoulli trials, Binomial, Poisson & Normal distribution.

Definition and applications of x_2, t, F & Z statistic: definition of confidence level & limits.

Suggested Readings:

Nelson D L and Cox M M (2008) Lehninger's Principles of Biochemistry, Macmillan Pub.
Berg J M, John L, Stryer L (2012) Biochemistry 6th Edn., W H Freeman & Co. Ltd.
Boyer R F (2009) Modern Experimental Biochemistry 3rd edn. , 5th Impression Pearson edn.
Freifelder D (1982) Physical Biochemistry, W H Freeman.
Wilson K and Walker J (2002) Principles and Techniques of Practical Biochemistry 5th Edn. Cambridge Pbn.
Zar J H Biostatistical Analysis 5th edn.
Freedman D (1998) Statistics 3rd Edn. W W Norton & Co. Pbn
Yates D S (2010) The Practice of Statistics 3rd Edn. W H Freeman

PAPER II
BIOCHEMISTRY PRACTICAL - II

MM 25

1. Estimation of amino acids by Ninhydrin method
2. Estimation of carbohydrates by Anthrone method
3. Separation of carbohydrates by paper chromatography
4. Separation of amino acids by paper chromatography
5. Separation of lipids / pigments using thin layer chromatography (TLC).

Suggested readings:

Boyer R F (2009) Modern Experimental Biochemistry 3rd edn. , 5th Impression Pearson edn.
Sadasivam S and Manickam A (2005) Biochemical Methods,(Rev Edn.) New Age Int. Pub, New Delhi.
Jayaraman (2011) Laboratory Manual in Biochemistry, New Age Int. Pub.
Plummer D T (2008 reprint) An Introduction to Practicals in Biochemistry3rd Edn., Tata McGraw- Hill
Sambrook J and Russel D W (2012) Molecular Cloning 4th edn., CSH Lab Press
Rao B S & Deshpande (2005) Experimental Biochemistry Students Companion I K International Pub
Damodaran G (2011) Practical Biochemistry, Pub Jaypee bros.
Nigam A & Ayyagiri A (2008) Lab Manual in Biochemistry, Immunology & Biotechnology, Tata McGraw Hill
Yadav V. K. et al (2012) Biochemistry & Biotechnology- A Lab Manual, Pointer Publns.