

**M.Sc, I SEMESTER
HARD CORE PAPER -3
BIOLOGICAL CHEMISTRY**

THEORY **32 Hrs**

UNIT I **8 Hrs**

- A) Structure of an atom, orbitals, chemical bonds - covalent, co-ordinate, ionic and hydrogen; Vander-Waal's force; hydrophobic interactions; Normality and Molarity of solutions.
- B) Carbohydrates – Chemistry and biological properties
Proteins-Ramachandran Plot and Christian Anfinsen's experiment,
Biological values of proteins

UNIT II **8 Hrs**

- A) Lipids: Chemistry, triglycerides; prostaglandins and steroids –biosynthesis,
Chemical importance of lipids.
- B) Enzymes: Nomenclature – current status; factors influencing velocity of enzyme reaction,
enzyme dynamics and enzyme inhibition.
Ribozymes and abzymes; co-enzymes, isozymes, clinical importance.

UNIT III **8 Hrs**

- A) Nucleic acids: Chemistry, alternative models of DNA, cyclic nucleotides-Chemistry and biosynthesis.
- B) Vitamins and trace elements – chemical nature, vitamins as co-enzymes, deficiency diseases, role of trace elements

UNIT IV **8 Hrs**

Techniques and Instruments employed in Biochemistry.
Colorimetry-Beer-Lambert Law; Spectrophotometry,
Chromatography-Paper, thin layer, Ion exchange and HPLC;
Electrophoresis, NMR Spectroscopy and ELISA.

Biological Chemistry Practicals **4x16=64 Hrs**

- 1. Colorimetry: The absorbance curves for two dyes and demonstration of Beer-Lambert's law. 4x4=16
- 2. Colour reactions of albumin. 2x4=8
- 3. Preparations of osazones and identification of carbohydrates. 2x4=8
- 4. Estimation of Proteins by Lowry *et al* method. 2x4=8
- 5. Thin layer chromatography of a plant extract. 1x4=4
- 6. Demonstration of gel electrophoresis. 2x4=8

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| 7. Estimation of amino acids by Sorenson's formal titration. | 1x4=4 |
| 8. Test for non esterified fatty acid | 1x4=4 |
| 9. Examination of the enzyme concentration on a rate of enzyme catalized reaction | 1x4=4 |

REFERENCES

1. Conn, E. E., Stumpt, P. K., Bruencing, G. and Dol, R. G. 1995. Outlines of Biochemistry. Pub. John Wiley, Singapore.
2. Harper, H. A. 1993. A review of Physiological Chemistry, Lange Medical Publication, 2nd Edn.
3. Lehninger, A. L., Nelson, D. L. and Cox, M. M., 2nd Edn. 1993. Principles of Biochemistry, CBS Publishers and Distributors, New Delhi.
4. Oser, B. L. (Ed.) 1993. Hawk's Physiological Chemistry. Tata Graw Hill Publishing Co. Ltd. New Delhi.
5. Plummer, D. T. 1993. Practical Biochemistry, 3rd Edn. Tata Mc Graw Hill Publishing Co., Ltd. New Delhi.
6. Wilson, K. and Walker, J. principles and Techniques in Practical Biochemistry. 1995. 4th Edn. Cambridge University Press, Cambridge, U. K.