

BIOCHEMISTRY (15PH403)

THEORY 3 hours/week

UNIT -I

1. Biochemical organization of the cell and transport processes across cell membrane. Outlines of biochemistry of cell division and metastasis.

2. The concept of free energy, determination of change in free energy from equilibrium constant and reduction potential, bioenergetics, production of ATP and its biological significance.

UNIT -II

3. Enzymes: Nomenclature, factors affecting enzyme action, enzyme kinetics and its mechanism of action, mechanism of inhibition, enzymes and iso-enzymes in clinical diagnosis.

4. Co-enzymes: Vitamins as co-enzymes and their significance, metals as co-enzymes and their significance.

UNIT -III

5. Carbohydrate Metabolism: Chemistry of Carbohydrates, Glycolysis and fermentation and their regulation, Gluconeogenesis, Glycogenolysis, Glycogenesis, and Pentose phosphate Pathway.

6. The Citric Acid Cycle: Significance, reactions and energetic of the cycle, Amphibolic role of the cycle and Anaplerosis.

UNIT -IV

7. Lipid Metabolism: Chemistry of lipids & Fats, Oxidation of fatty acids; β -oxidation & energetics, α -oxidation, ω -oxidation, Biosynthesis of ketone bodies and their utilization, Biosynthesis of saturated and unsaturated fatty acids, control of lipid metabolism, Essential fatty acids & Bio synthesis of eicosanoids (prostaglandins, thromboxanes and leukotrienes), phospholipids and sphingolipids.

UNIT-V

8. Chemistry of Proteins and Nucleic acids: Outlines of the mechanism of protein and nucleic acid synthesis and catabolism. Principles of biological oxidation and detoxification mechanisms.

BIOCHEMISTRY

PRACTICAL 3 hours/week

(A minimum of 15 experiments shall be conducted)

1. Preparation of standard buffers (citrate, phosphate and carbonate) and measurement of pH.

2. Colorimetric estimation of blood glucose.

3. Estimation of cholesterol, creatinine, urea and uric acid in biological fluids.

4. Qualitative test for normal and abnormal constituents of urine.

5. Estimation of reducing sugars in urine.

6. Estimation of bilirubin content the blood.

7. Enzymatic hydrolysis of glycogen by alpha and beta amylases.

8. Effect of temperature on the activity of alpha amylases.

9. Estimation of Blood Cholesterol

10. Estimation of SGOT, SGPT by UV Spectrophotometer.

11. Estimation of serum alkaline phosphate and acid phosphatase levels.

12. Estimation of serum sodium, potassium and calcium levels.

RECOMMENDED BOOKS:

1. Harper's Biochemistry R.K.Murray and Others (Prentice Hall of India, New Delhi)
2. Biochemistry by Stryer. (W.H. Freeman, New York)
3. Text Book of Biochemistry by West & Todd (Oxford & IBH Pub., Co., New Delhi)
4. Fundamentals of Biochemistry by Dr.A.C.Deb (New Central Book Agency, Calcutta)
5. Text Book of Biochemistry by Dr.A.V.S.S.Rama Rao (UBS Publishers & Distributors, New Delhi)
6. Text Book of Biochemistry by Dr.Satyanarayana