M Sc. Biochemistry - 2017

Note: The syllabus prescribed for the entrance test has been divided into fifteen units. Each unit carries a weightage of four marks. Paper setters are required to set four multiple choice type questions with only one correct or most appropriate answer separately for each unit, giving uniform representation to the whole syllabus contained therein.

Unit 1

- Laws of thermodynamics
- Concepts of heat of reaction, enthalpy, entropy
- Electrochemistry

Unit 2

- Electro-negativity
- Acid base equilibria
- Essential and trace elements in biological system

Unit 3

- Concepts of chemical bonding
- Electron displacements
- Dipole-dipole interactions: hydrogen bond, Vander-waals forces, hydrophobic and hydrophilic interactions

Unit 4

- Isomerism
- Soaps and Detergents
- Spectroscopy

Unit 5

- Photosynthesis and its mechanism
- Significance and mechanism of respiration
- Importance of water to plant life.
- Transpiration mechanism.
- Methods of study of macro and micro nutrients availability, uptake and role

Unit 6

- Ecology and environmental conservation
- Air, water pollution and their control, renewable and non renewable recourses, protection, conservation and management.
- Toxicity of metals and the reasons of toxicity
- Use of radioisotopes as a tracer in chemical reactions, in agriculture, industry and medicine
- Concepts of Evolution, ecosystem, nitrogen, phosphorus and carbon dioxide cycle

Unit 7

- Structure, transmission and role of viruses
- Bacterial – morphology and their growth
- Host Parasite relationship
- Applications of microbiology

Unit 8

- Structure, Classification, Properties and importance of Proteins, Enzymes, lipids, nucleic acids and carbohydrates
- Chromosome Structure, hereditary, linkage & recombination

Unit 9

- Mutation
- Variation in chromosome number
- DNA as genetic material, replication, transcription, Genetic Code, mechanism of protein synthesis and regulation
- Various structural levels of nucleic acids

Unit 10

- Restriction and modification system
- Transformation, Transduction
- Cell, tissue and organ culture, methods and practical applications

Unit 11

- Introduction, Scope and significance of biotechnology
- Elementary idea of Genetic Engineering

Unit 12

- Historical Perspective, Scope and significance of developmental biology
- Cell Cycle and its different stages
- Morphology of cell – Prokaryotic and eukaryotic
- Structure, composition and function of cell wall, plasma membrane, mitochondria, plastids, endoplasmic reticulum nucleus, nucleoli, lysosomes and ribosomes

Unit 13

- Blood components and their functions
- Composition and functions of lymphatic system
- Overall anatomy and function of various components of human circulatory, respiratory, excretory, nervous, digestive and endocrine system

Unit 14

- Glycolsis , TCA cycle, pentose phosphate pathway, Gluconeogenesis, Glycogen synthesis and breakdown,
- β-oxidation of fatty acids, metabolism of fatty acid, triacylglycerol and cholesterol
- Electron transport chain and oxidative phosphorylation
- Transamination and deamination reactions, urea cycle, metabolism of phenylalanine, tyrosine, tryptophan.

Unit 15

- Metabolism of purines and pyrimidines.
- Basic concepts of immunology
- Basic concepts of nutrition
- Definition and scope of clinical biochemistry in diagnosis
- Enzyme patterns in health and disease states with reference to plasma lipase, amylase, cholinesterase, alkaline and acid phosphatase, SGOT, SGPT, LDH and CPK, kidney function and liver function tests.