SYLLABUS FOR BT Ph.D. ENTRANCE EXAMINATION

Biomolecules – Bioenergetics, metabolism and Techniques

Biomolecules- structure and function, intra- and intermolecular forces, bioenergetics,biochemical equilibria, Enzyme kinetics, metabolism of carbohydrates, lipids, proteins and nucleic acids and biochemical techniques

Principles of Molecular biology, Genetic engineering and Immunology

DNA replication in prokaryotes and eukaryotes, DNA damage and repair, recombination, Transcription and translation in prokaryotes and eukaryotes, RNA processing, genetic code, post-translational modifications, transfer of genetic material in microorganism, gene silencing, oncogenes, genetic disorders (syndromes), apoptosis, DNA modifying enzymes, Genomic & cDNA libraries, Molecular cloning Techniques and Applications, Transgenic plant and animals & their applications, CRISPER-Cas9, Innate and adaptive Immunity, Antigen & antibody and their interactions.

Fundamentals of Industrial Microbiology and Biotechnology

Microbial growth and nutrition, microbial physiology, preservation and control of microorganisms, Bioprocessing fundamentals, Downstream processing, Bioremediation and Biofuels.

Fundamentals of Computational biology

Biological databases, biological sequence formats, pairwise sequence alignment – methods and algorithms, FASTA, BLAST, multiple sequence alignment and phylogenetics, structural bioinformatics, Ramachandran plot, protein secondary and tertiary structure prediction methods, DNA sequencing methods.