

Syllabus: Ph.D. Entrance Exam 2022

LIFE SCIENCES

Microscopic Techniques, Plasma Membrane Structure, Membrane Transporters; Cytoskeleton: Structure and Dynamics; Microtubules and Mitosis; Intracellular protein transport; Cell organelles, Cell Signaling pathways; Cell - Cell Adhesion and Communication; Cell Cycle; Mitosis, Meiosis, Role of Cyclins and Cyclin Dependent Kinases; Apoptosis and senescence; hallmarks of cancer cells. Genome organization in prokaryotes and eukaryotes, -Nuclear and Mitochondrial DNA, DNA Replication and repair, Transcription, RNA Processing, Translation, Gene Expression Regulation, gene silencing, coding and non-coding DNA, Mitochondrial inheritance, molecular cytogenetics, gene mapping, Mendelian genetics and determinants of inheritance, Animal models for human diseases, human genome project. Physiology and biochemistry of prokaryotes, soil microbiology, agriculturally important microorganisms, basics of rDNA technology. General and applied aspects of microbiology; Medical microbiology, antimicrobial resistance; Microbial evolution, taxonomy, and diversity; Microbial ecology; Bioremediation, bacterial metabolism, ultrastructure of bacteria, tools and techniques of a microbiology lab. Basics of innate and adaptive immunity, MHC structure, function and regulation, Concept of memory B and T cell generation, immunosuppression and immunomodulation, history of vaccination. Components of the Nervous System, Brain parts and endocrine regulation, Neuron and Glial Cells - Different Types, Structure, Function. Synapse: Nerve Impulse, Neurotransmitters, Organization of Nervous System- CNS

Sd. *bala*
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