SR University,Warangal

PhD Entrance Syllabus

Structure of the PhD Entrance Test (100 Marks)
Section A: Aptitude and Reasoning – Common to all candidates (50 Marks) Section B: Subject-Specific (BioTechnology) (50 Marks)

Section A: APTITUDE & REASONING (Common to ALL)

Unit–1: Verbal Reasoning

Navigating Directions and Mastering Distances, Blood Relations, Logical Puzzles and Problem Solving- Floor Based, Month and Year Based. Seating Arrangements - Circular, Linear, Decoding the Code- Letter Coding, Number Coding, Letter and Number Coding.

Unit-2: Number System

Mastering Quick Calculations, BODMAS Simplified, Exploring Numbers and Division Rule, Unit Digits Decoded, Unlocking Divisibility and Counting Zeroes, "Mastering LCM and HCF: Foundations of Factorization, Uncovering Factors, Exploring Remainders.

Unit-3: Arithmetic Ability-1

Percentages - Fraction, Decimal, Percentage Change, Concept of 'By' and 'To', Product Constancy, All About Averages, Profit & Loss Essentials, Articles, False Weight, and Discount Insights - Discount, Simple Interest: Calculations and Applications, Compound Interest: Calculations and Applications, Relationship between SI and CI.

Unit–4: Arithmetic Ability-2

Ratio, Proportion, Partnership, Problems on Ages, Time and Work - Concept of Efficiency, Smart Work with Time and work, Negative Work, Chain Rule, Pipes and Cisterns, Time, Speed & Distance, Problems based on Trains, Problems based on Boats and Streams.

Unit-5: Critical Reasoning

Analogy and Classification, Sequence and Series Logic, Syllogisms - Types of statements, Venn diagrams using statements, Method to solve problems Two Statements and Two Conclusions, EITHER-OR Conclusions, Four Statements and Two Conclusions.

Department of Basic Sciences
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Section: B **Biotechnology Syllabus for Ph.D. Admission Eligibility Test** (any 5 modules)

Module I: Biomolecules and Biophysical Chemistry. Structure and interactions of atoms and biomolecules, principles of pH, buffers, and chemical equilibria, along with bioenergetics, metabolism (glycolysis and oxidative phosphorylation), and enzyme kinetics, regulation, and catalysis.

Module II: Cell Biology and Organization. Cell structure and function, membrane dynamics, organelles, cytoskeleton, the cell cycle, cell junctions, and the basics of signal transduction.

Module III: Molecular Genetics and Gene Expression. DNA replication, repair, recombination, RNA and protein synthesis, and the regulation of gene expression at transcriptional and translational levels.

Module IV: Cell Communication and Signaling. Hormones and signal transduction pathways, host-parasite interactions, bacterial and plant signaling systems, and secondary messengers like cAMP, cGMP, calcium, and kinases.

Module V: Developmental Biology. Development from gametogenesis to organogenesis, including gene regulation, morphogenesis, programmed cell death, and ageing in animals and plants.

Module VI: Plant and Animal Physiology. Plant physiology (photosynthesis, hormones, stress responses) with animal physiology (circulatory, nervous, respiratory, endocrine, and immune systems).

Module VII: Genetics and Inheritance. Mendelian genetics, gene mapping, sex determination, mutations, human genetics, and non-Mendelian inheritance, including extrachromosomal traits.

Module VIII: Evolution, Biodiversity, and Ecology. Emergence and development of evolutionary theories, molecular evolution, and the origin of life. Ecological principles, population and community dynamics, ecosystems, biodiversity conservation, environmental pollution, and the impact of global environmental changes.

Module IX: Applied Biology and Research Techniques. Biotechnology applications, genomics, proteomics, bioinformatics, and experimental methods like microscopy, spectroscopy, electrophoresis, and statistical tools.

Module X: Bioinformatics and Tools. Biological databases, sequence alignment, gene and protein prediction, phylogenetics, structural modelling, and bioinformatics algorithms. Includes data mining, molecular visualization, network analysis, and applications in genomics, medicine, agriculture, and systems biology.