

**SUBJECT : BOTANY**

**SYLLABUS FOR Ph.D ENTRANCE TEST**

**(I) PROKARYOTES**

- a) General Features and Phylogenetic Overview
- b) Structure of Bacterial Cell, Bacterial Genome, Plasmid.
- c) Bacterial Nutrition - Culture, Media, Bacterial Growth.
- d) Genetic Recombination – Transformation, Transduction, and Conjugation.

**(II) ENZYMES**

- a) Naming and Classification of Enzymes.
- b) Kinetics and Mechanism of Action.

**(III) CELL STRUCTURE AND FUNCTION**

**CELL : Its Structure and Functions, Plasma membrane, Transport across Plasma membrane.**

**(IV) PLANT PHYSIOLOGY**

- a) Plant Water Relationship, Diffusion, Osmosis.
- b) Chemical Potential of water and Water potential.
- c) Radial Movement of Water from root pressure to the tracheary element.
- d) Ascent of Sap - Mechanism.
- e) Photomorphogenesis : Phytochrome, Cryptochrome, Phototropin, Photoperiodism, Florigen, Vernalisation, Flowering genes.

**(V) GENETICS**

- a) Mendel's Principles.
- b) Gene Interaction, Linkage and Crossing Over.
- c) Gene Mapping, Interference and Coincidence
- d) Quantitative Inheritance - Quantitative trait locus analysis, Heritability.

**(VI) GENOME - Genome Complexity, Introns, Transposable elements .**

**(VII) MUTATION - Mutagen, Types of Mutation, Fluctuation test, Replica Plating.**

**(VIII) ECOLOGY AND ENVIRONMENT BIOLOGY**

- a) Ecosystems - Components, Productivity, Energy flow.
- b) Community Ecology - Community structure, Species composition and Diversity, Simpson's diversity index, Shannon diversity index.
- c) Ecological Succession : Pattern, Types, Mechanism and models of Succession.
- d) Biodiversity - Level, Gradients and Magnitude of Biodiversity, IUCN and Red list Categories.

*Q. P. d.*  
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