#### 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.

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