Syllabus of Botany
For Ph.D. Entrance Exam 2020-21

1. **Microbiology and Plant Pathology -**
Structure and multiplication of viruses, various bacteria, fungi, mycoplasma & Phytoplasma, Applications of microbiology in agriculture, industry, medicine and in control of soil water pollution.
Important crop diseases caused by viruses bacteria, mycoplasma, fungi and nematodes, modes of infection and dissemination, Molecular basis of infection and disease resistance/defense Physiology of parasitism and control measures; Fungal toxins, Modeling and disease forecasting; Plant quarantine seed pathology.

2. **Cryptogams:**
Algae, Fungi, lichens, braoyophytes, Pteridophytes Structure and reproduction from evolutionary viewpoint, sistribution of cryptogams in India and their ecological and economic importance.

3. **Phanerogams:**
Gymnosperms concept of Progymnosperms, Classification and distribution of gymnosperms, Geological time scale Types of fossils and their study techniques.
Angiosperms:
Systematic, anatomy, embryology, Palynology, Methods of taxonomy of plants, animals and micro-organisms. Numerical taxonomy and Chemo taxonomy.

4. **Diversity of life forms:**
Structural organization: unicellular, colonial and multi cellular forms, levels of organization of tissues organs & systems, comparative anatomy.
Stomata and their types, Glandular & non glandular trichomes, secondary growth, wood anatomy.

5. **Developmental Biology:**
Basic concept of development, Gametogenesis fertilization and early development, Morphogenesis and organesis in plants. Programmed all death, aging and senescence.
(Development of male and female gametophyte, pollination, fectilization, Embryo development, Polymbrayony and apomixes, Plolynology; experimental embryology including pollen storage and test tube fertilization)

* **Morphogenesis:**
Totipotency, polarity, symniety and differentiation Protoplast culture, somatic hybrids, Micropropogation somaclonal Variation: Pollen haploids, imbryo rescue.

6. **Plant resource development:**
Domestication and introduction of plants, origin and cultivated plants, Plants as sources for food, fibra fodder, spices, beverage, edible oils, drugs, narcotics insecticides, timber, gums, resins and dyes, latex cellulose, Starch, perfumery, Importance of Ethnobotany Botanical gardens and Harbaua.

7. **Inheritance Biology:**
Mendelian principles, Gene mapping methods Microbial genetics

8. **Ecological Principles:**
The environment - Physical & biotic environment biotic and abiotic interactions, Communi ecology Ecosystem - structure & function, mineral cycling (CNP), Primary production and decomposition, structure and function of some Indian ecosystems.
Applied ecology - Encironmental pollution global environmental change, biodiversity status, monitoring and documentation, major drivers of biodiversity chang, management approaches. Microbiology of atmosphere.

9. **Applied Biology:**
Microbial fermentation and production of small and macro molecules.
Application of immunological principles, tissue and cell culture methods for plants, Transgenic plants, molecular approaches to diagnosis and strain identification, Bioresources and uses of biodiversity. Plant and human welfare. Role of Plants in human life, importance of plants.