

# **BOTANY**

## **PAPER -I**

**Morphology :** External morphology of vegetative and reproductive structures, Micro and Megasporogenesis, Fertilization, Post fertilization changes leading to formation and development of embryo, Endosperms, Seeds and fruits, Dehiscence of fruits and seed dispersal.

**Anatomy :** Cell as a unit of life. Ultrastructure, cell formation. Tissue system and their classification with special reference to anatomical and physiological aspects, Secondary growth including anomalous types, Types of stele and their evolution from simple to complex forms, Comparison of vascular anatomy of root-stem transition region with that of stem or root.

**Cryptogams :** Variations in structure and reproduction in the main classes, their relationship and trends of evolution with particular reference to the following types :

**Algae**

- Myxophyceae : Nestoc, Anabaena
- Chlorophyceae : Volvox, Chlorella, Ulothrix, Cosmarium, Chaetophora, Chara hydrodictyon, Oedogonium
- Bacillariophyceae : General account
- Xanthophyceae : Vaucheria
- Phaeophyceae : Extrocarous, Dictyota, Fucus
- Rhodophyceae: Batrachospermum, Polysiphonia

Economic uses of Algae

**(Fungi) :** Classification, distinguishing features and reproduction in different types with particular reference to the following :

- Phycomycetes : Phytophthora, Cystopus
- Ascomycetes : Saccharomyces, Penicillium Eryshiphae
- Basidiomycetes : Ustilago, Puccinia, Psalliota
- Fungi-Imperfecti : Helminthosporium, Fusarium,

**(Lichens) :** Classification and economic uses.

**(Bryophytes):** Structure, reproduction, sporophytic evolution, comparative study and interrelationships of bryophytes with special reference to the following types: Marchantia, Anthoceros, Sphagnum.

**(Pteridophytes) :** A general account, Classification comparative morphology, anatomy and reproduction in the Pteridophytes including evolutionary tendencies with particular reference to the following types : Lycopodium, Isoetes, Marsilea.

(Gymnosperms) : General classification, comparative study on morphology, anatomy and reproduction. Representative type study on Cycas, Pinus, Gnetum, Knowledge of fossil formation and fossil gymnosperms.

(Angiosperms) : Principles of classification, Merits and demerits of old systems of classification, Origin and evaluation of angiosperms, Critical studies on the following families :

Poaceae, Liliaceae, Musaceae, Arecaceae, Orchidaceae, Brassicaceae, Cucurbitaceae, Ericaceae, Tiliaceae, Malvaceae, Rutaceae, Fabaceae, Apicaceae, Lamiaceae, Epocynaceae, Asteraceae, and Buphorbiaceae.

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#### **PAPER -II**

Physiology : Absorption and conduction of water and salts, Transpiration, Mechanism of opening and closing of stomata, Major and minor elements and their role in plant nutrition, Methods of determination of essentiality of elements, Micro and macro nutrients, Photosynthesis in mechanism and importance, Factors affecting the process, Nitrogen metabolism respiration, Fermentation -metabolism and importance, Factors affecting them, Growth and development, Plant hormones, their function and uses physiology of reproduction-photoperiodism and vernalization plant movements.

Ecology : Basic concepts of Ecology, Ecological factors, Concepts of plant community, Plant succession and invasion, Development of community and their association.

Phytogeographical regions of India & Flora of Assam.

Cytogenetics : Cytoplasm, Nucleus and other cell inclusions and structure of chromosome, cell divisions and

Plant Breeding : Polyploidy, Mendel's Laws, pre and post Mendelian concept of inheritance, Linkage and crossing over, Chromosome theory of heredity, mutation, Principles and methods of plant breeding.

Evolution : General concept, evidences of evolution. Theories of evolution.

Economic Botany : Botanical names, process of cultivation and manufacture of products and uses of the following plants of human welfare:

Cereals : Rice, Wheat, Maize

Legumes : Soyabean, Pea, Gram, Ground-nut.

Oil : Mustard, Coconut, Castor

Fibre : Cotton, Jute

Beverage : Tea

Sugar : Sugar-cane

Drugs : Cinchona, Atropa, Belladonna, Rauwolfia.