

# 1S – BOTANY

## Diversity & Applications of Microbes and Cryptogams

### UNIT-I : Plant Diversity (15)

- 1.1 Cyanobacteria and its impact on origin of life
- 1.2 Introduction to Plant Kingdom: Cryptogams
- 1.3 Diversity of plants with respect to habitat, form, nutrition and ecological status
- 1.4 General Account of Viruses and structure of TMV and HIV
- 1.5 Bacteria: structure, Nutrition and reproduction
- 1.6 Role of microbes in Agriculture, Medicine and Industries

### UNIT-II: Algae (15)

- 2.1. Classification according to F. E. Fritsch and G. M. Smith up to classes
- 2.2. General characters of algae with reference to Habitat, Thallus organization, Pigmentation, Reserve food and Reproduction
- 2.3. General characters of following classes with special reference to examples mentioned –
  - 2.3.1. Chlorophyta - *Oedogonium*
  - 2.3.2. Charophyta – *Chara* (Thallus structure and reproduction)
  - 2.3.3. Phaeophyta – *Sargassum* (Thallus structure and reproduction)
  - 2.3.4. Rhodophyta – *Batrachospermum*

### UNIT-III : Fungi (15)

- 3.1. Classification according to Ainsworth (1973)
- 3.2. General characteristics of following classes with special reference to examples mentioned –
  - 3.2.1. Mastigomycotina : Albugo (Cystopus)
  - 3.2.2. Ascomycotina : Aspergillus
  - 3.2.3. Basidiomycotina : *Puccinia graminis-tritici*
  - 3.2.4. Deuteromycotina : General characters
- 3.3 Lichen-Types & Economic importance

### Unit-IV : Bryophyte (15)

- 4.1. Classification according to G. M. Smith
- 4.2. General characters, thallus organization and life cycle of–
  - 1.2.1. Hepaticopsida – *Marchantia*
  - 1.2.2. Bryopsida – *Funaria*
- 4.3. Evolution of sporophyte in bryophytes
- 4.4. Affinities of bryophytes with algae and pteridophytes
- 4.5. Brief Account on some Indian Bryologist.

### Unit-V: Pteridophyte (15)

- 5.1. Pteridophytes as First Vascular Plants.
- 5.2. Classification according to G. M. Smith
- 5.3. General characters of the following classes with special reference to examples mentioned –
  - 5.3.1. Sphenopsida – Equisetum
  - 5.3.2. Filicopsida – Marsilea
- 5.4. Stele types in pteridophytes
- 5.5 Heterospory and Seed Habit in Pteridophytes

### Unit-VI : Application of Microbes Cryptogams (15)

- 6.1. Economic Importance of Algae with special reference to Food, Industries, Agriculture and Harmful aspects
- 6.2. Mycorrhiza – Types and Application
- 6.3. Role of Fungi in Industries, Medicine, Food & Agriculture
- 6.4. Plant Diseases –
  - 6.4.1. Viral – TMV
  - 6.4.2. Bacteria – Black arm of cotton (*Xanthomonos malvacearum*)
  - 6.4.3. Fungal – Tikka disease of groundnut (*Cercospora* sps.)
- 6.5. Economical and Ecological Importance of Bryophytes

## LABORATORY EXERCISE :

### I. ALGAE

Preparation of temporary mount, identification with reason of following algal materials- Oedogonium, Hydrodictyon, Chara, Vaucheria, Ectocarpus, Sargassum, Batrachospermum

### II. FUNGI AND PLANT PATHOLOGY

(1) Study of following genera

Albugo, Uncinula, Penicillium, Agaricus, Puccinia, Cercospora

(2) Study of Crustose, Fruticose & Foliose Lichen

(3) Study of symptoms of fungal, viral, bacterial and Mycoplasmal diseases

(4) Collection of fungal specimen & infected plant part from local region

(6) Demonstration of Mushroom Cultivation Technology

### III. BRYOPHYTES

Study of external and anatomy features of vegetative

and reproductive parts of following genera – Marchantia, Anthoceros, Funaria, Polytrichum and Sphagnum

### IV. PTERIDOPHYTES

Study of Pteridophyte external and anatomy features of vegetative and reproductive parts of following genera – Lycopodium, Equisetum, Osmunda, Selaginella, Adiantum, Marsilea and any one fossil specimen

**Note:** 1. Omit the details of development of sex organs and sporophyte.

2. Botanical excursion (Two local and one outside the state is compulsory)

3. Common algal, fungal, pathological, bryophytic and pteridophytic collection and excursion report must be submitted at the time of practical examination.

## B. Sc. I : Semester – I Practical Schedule

**Time : 4 hours**

**Marks : 50**

Q1: Temporary mount and identification of given algal form (any two)	10
Q2: Temporary mount and identification of given fungal form (any two)	10
Q3: Salient features and identification of bryophytic material	05
Q4: Salient features and identification of pteridophytic material	05
Q5: Spotting (Algae, Fungi, Bryophyte, Pteridophyte, Pathology)	10
Q6: Viva-voce and Practical Record	05
Q7: Excursion Report	05

## 2S – BOTANY

### Gymnosperm, Morphology of Angiosperms and Utilization of Plants

#### UNIT-I: Palaeobotany (15)

- 1.1. Process of plant fossilization and types of fossils
- 1.2. Geological Time Scale
- 1.3. Fossil Gymnosperms
- 1.3.1. Pteridospermales: *Lyginopteris oldhamia*
- 1.3.2. Bennettitales: *Bennettites*

#### UNIT-II : Gymnosperms (15)

- 2.1. Classification according to D. D. Pant
- 2.2. General account: morphology, anatomy, life cycle and taxonomic position of *Pinus* and *Gnetum*
- 2.3. Affinities with pteridophytes and angiosperms
- 2.4. Economic importance of Gymnosperms

#### UNIT-III : Morphology (15)

- 3.1. Diversity in Plants habits – Annual, biannual, perennials
- 3.2. Roots – Types of root : tap and adventitious, modification of root : for food storage, respiration, and supports.
- 3.3. Stem – Types of Stem, Characteristic features, branching, modification of Stem – Underground and aerial
- 3.4. Leaf – Parts of leaf, types of leaves – simple and compound; Phyllotaxy; Venation; Stipule. Modification of leaves

#### UNIT-IV : Morphology (15)

- 4.1. Inflorescences – Types: Racemose, Cymose and Special.
- 4.2. Flower – Flower as modified shoot; Structure of flower – Calyx, Corolla, Androecium and Gynoecium. Placentation; Types of Pollination.

#### UNIT-V : Morphology and Utilization of Plants (15)

- 5.1. Fruits – Morphological types
- 5.2. Utilization of Plants
- 5.2.1. Food Plants – Wheat, Potato – Morphology, varieties and economic importance.
- 5.2.2. Fiber Plant – Morphology, varieties and economic importance of Cotton.
- 5.2.3. Oil yielding Plant – Morphology, Varieties and economic importance of Ground nut.

#### UNIT-VI : Utilization of Plants (15)

- 6.1. Spices – General account and economic importance of Black pepper, Clove, Cinnamon and Cardamom
- 6.2. General account and sources of firewood, timber and Bamboos.
- 6.3. Essential oils – General account, economic importance of Eucalyptus.
- 6.4. Pharmacognosy and Phytochemistry with respect to following medicinal plants –
  - 6.4.1. *Aloe vera*
  - 6.4.2. *Adathoda vasica*
  - 6.4.3. *Asparagus racemosa*
  - 6.4.4. *Azadirachta indica*
  - 6.4.5. *Catharanthus roseus*
  - 6.4.6. *Chlorophytum borivillianum*
  - 6.4.7. *Emblica officinalis*
  - 6.4.8. *Ocimum sanctum*
  - 6.4.9. *Rauwolfia serpentina*
  - 6.4.10. *Vitex negundo*
  - 6.4.11. *Withania somnifera*

## LABORATORY EXERCISE

- I. Gymnosperms: Morphology and anatomy of the following members –
  - a. Pinus
  - b. Gnetum
- II. Preparation of double stained permanent mount of Pinus stem, needle and Gnetum stem and leaf.
- III. Study of fossil slides of Lyginopteris and Bennettites
- IV. Detailed morphological study of types of root, stem and leaf with its modifications
- V. Forms of corolla
- VI. Types of placentation
- VII. Morphology of fruits
- VIII. Morphology of plant parts used and medicinal plants prescribed in syllabi
- IX. Utilization of plants: Spices, fiber yielding plants and food plants prescribed in syllabi

### Semester – II Practical Schedule

Time : 4 hours

Marks : 50

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| Q1. Preparation of double stained permanent mount of given Gymnospermic material and identification with reasons   | 10 |
| Q2. Comments on given Morphological specimens <ol style="list-style-type: none"><li>i. Root</li><li>ii. Stem</li><li>iii. Leaf</li><li>iv. Inflorescence</li><li>v. Flower</li><li>vi. Fruit</li></ol> | 12 |
| Q3. Comment on given medicinal plant with reference to morphology, part used and medicinal importance (Any two)  | 10 |
| Q4. Spotting (02 marks each) <ol style="list-style-type: none"><li>a) Palaeobotany, b) Gymnosperms and c) Utilization of Plant (food, fibers, spices) (2 Materials)</li></ol>                          | 08 |
| Q5. Practical record   | 5  |
| Q6. Viva voce and Excursion report   | 5  |