

M.Sc. Botany

(Semester-I)

MBOTCC-I: Phycology, Mycology and Bryology (5 Credits)

Time: 3hrs

Marks: 70

The question paper will consist of 7 questions divided into 3 sections.

Section A: Question No.1 will be compulsory comprising ten objective types questions (two from each Unit) each carrying two marks (10 x 2 : 20 marks).

Section B: Question No. 2 will also be compulsory and comprise five short answer types questions (one from each Unit) and students will have to attempt only four questions (4 x 5: 20marks).

Section C: Five long answer types questions are to be set (one from each Unit) of which any three questions are to be answered (3 x 10:30 marks).

Unit I

Thallus organization of algae, Cell ultra-structure and Reproduction: Vegetative, asexual and sexual. Role of pigments, reserve food, cell wall, flagella, eye spot and pyrenoids in classification and evolution of algae. Use of algae as food, feed and in industry. Indian phycologists and their contributions

Unit II

Salient features of Chlorophyta, Charophyta, Xanthophyta, Bacillariophyta, Phaeophyta and Rhodophyta

Unit III

General characters of fungi, Cell ultra structure, unicellular and multicellular organization, cell wall composition, nutrition (saprobic, biotrophic, symbiotic), reproduction (Asexual and Sexual), Heterothallism, Parasexuality. Classification of fungi: Recent trends (with reference to Ainsworth 1973 and Alexopoulos and Mins 1979).

Unit IV

Brief account of Ascomycotina, Basidiomycotina, Deuteromycotina. Fungi in industry, medicine and as food. Fungi as biocontrol agents

Unit V

Classification and general features of Marchantiales and Jungermanniales, Anthocerotales, Sphagnales and Polytrichales. Vegetative propagation and perennation in Bryophytes. Evolution of Sporophytes in Bryophytes

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MBOTCC-2: Microbiology and Plant Pathology (5 Credits)

Time: 3hrs

Marks: 70

The question paper will consist of 7 questions divided into 3 sections.

Section A: Question No. 1 will be compulsory comprising ten objective types questions (two from each Unit) each carrying two marks (10x2=20 marks).

Section B: Question No. 2 will also be compulsory and comprise five short answer types questions (one from each Unit) and students will have to attempt only four questions (4 x 5:20marks).

Section C: Five long answer types questions are to be set (one from each Unit) of which any three questions are to be answered (3 x 10:30 marks).

Unit I

General introduction; History and scope of microbiology. Methods of microbiology: Sterilization-Different types of sterilization (moist heat, dry heat, filtration, radiation and chemicals). Diversity of microorganisms: Archaea, Bacteria, Cyanobacteria, Phytoplasma

Unit II

Structure of bacteria: Ultra structure of Gram positive and Gram negative bacteria; reproduction (vegetative, asexual and genetic sexual recombination); economic importance of bacteria. Viruses: Nature, characteristics and ultrastructure of Virions (TMV and Bacteriophages), multiplication (Lytic and Lysogenic cycles) and transmission of viruses

Unit III

Agriculture Microbiology: Biological nitrogen fixation and Biofertilizer. Industrial Microbiology: Industrial production of organic acids (citric acid), antibiotics (penicillin) and enzymes (amylase)

Unit IV

Classification of Plant disease and appearance of symptoms due to different microbes. Role of enzyme and toxin in pathogenesis. Host defence mechanism with special reference to structural and biochemical defence

Unit V

Seed pathology with special reference to seed-borne mycoflora, mycotoxin and its hazard Quarantine regulation and seed certification. Etiology, symptoms and control measures of the following plant diseases: Rust of linseed, Leaf blight of maize, Tikka disease of groundnut, Bunchy top of banana, black tip of mango, Yellow vein mosaic of bhindi, Little leaf of brinjal and Citrus canker

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(Semester-I)

MBOTCC-3: Pteridophyta, Gymnosperm & Paleobotany (5 Credits)

Time: 3hrs

Marks: 70

The question paper will consist of 7 questions divided into 3 sections.

Section A : Question No.1 will be compulsory comprising ten objective types questions (two from each Unit) each carrying two marks (10 x 2 = 20 marks).

Section B : Question No. 2 will also be compulsory and comprise five short answer types questions (one from each Unit) and students will have to attempt only four questions (4 x 5=20marks).

Section C: Five long answer types questions are to be set (one from each Unit) of which any three questions are to be answered (3 x 10:30 marks).

Unit- I

Classification of Pteridophytes. Detailed general features: vegetative and reproductive, with special reference to development, characterization, position and kind of protection provided to the spore producing organs of the sporophytes and sexuality of the gametophytes in the following classes/orders: Psilopsida – Psilotales. Lycopsidea - Lycopodiales, Selaginellales and Isoetales. Special discussion has to be made about: Stellar evolution within Lycopodiales. Heterospony vs. seed habit, with special reference to Selagineilales

Unit- II

Sphenopsida -Equisetales (only a brief account) Pteropsida. Characterization, classification and distinction between Eusporangiate, Protileptosporangiate and Leptosporangiate. Structure, reproduction and Phylogenetic considerations of the followings: Eusporangiate - Ohioglossales. Leptosporangiate - Marsiliales , Salviniales. Special reference has to be made about the followings: Economic importance of pteridophytes

Unit-III

Characteristic features, distribution and economic importance of gymnosperms Classification of Gymnosperms. Comparative morphology, anatomy, reproductive structures and interrelationships of the following living orders : Cycadales, Ginkgoales, Taxales

Unit- IV

Coniferales: Characteristic features, families of modern conifers, their distribution and economic importance. Comparative account of reproductive structures of Ephedrales, Gnetales, Welwitschiales. Phylogenetic relationship, angiospermic feature and evolutionary significance of order Ephedrales and Gnetales.

Unit-V

Types and Nomenclature of fossils; Fossilization process and geological time-scale; Principles and objectives of fossil study. Comparative morphology, anatomy, reproductive structure and affinities of the following : fossil groups: Psilophytales, Cordaitales, Pentoxylales

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MBOTCC-4: Practical 1 (Based on MBOTCC 1,2 & 3) (5 Credits)

Time: 5hrs

Marks: 70

1. Principles and use of different sterilization instruments like autoclave. oven. Laminar air flow system etc.
2. Preparation of media (Potato Dextrose Agar).
3. Isolation of fungi from soil.
4. Identification of fungal isolates.
5. Preparation of Nutrient Agar (NA) media.
6. Isolation of bacteria from water.
7. Characterization of bacterial isolate by Gram's staining.
8. Counting of fungal spore by haemocytometer.
9. Temporary slide preparation and study of common Algae.
10. Temporary slide preparation and study of common Fungi.
11. Study of vegetative habit, anatomy and reproductive morphology of common Bryophyta (*Marchantia, Anthoceros* etc.)
12. Study of vegetative habit, anatomy and reproductive morphology of common Pteridophyta (*Psilotum, Lycopodium, Ophioglossum, Marsilea* etc.).
13. Study of vegetative habit, anatomy and reproductive morphology of common Gymnosperm (*Cycas, Pinus, Ginkgo, Gnetum* etc.).
14. Study of common fungal diseases- Rust of linseed, Blight of potato, Rust of wheat, Stem gall of coriander, Downy mildew, Powdery mildew etc.