

Total No. of Questions : 8]

SEAT No. :

P482

[Total No. of Pages : 2

[4334] - 101

M.Sc. (Semester - I)

BOTANY

BO - 1.1 : Systematics of Non Vascular Plants

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, taking atleast Two questions from each Section.*
- 2) *Answers to the TWO sections should be written in SEPARATE answer books.*
- 3) *All questions carry EQUAL marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary.*

SECTION - I

Q1) Describe the thallus organization in Rhodophyta and comment on interrelationship between phaeophyta and Rhodophyta. **[16]**

Q2) Give an account of gametophytes of order Marchantiales. **[16]**

Q3) Write short answers of the following : **[16]**

- a) Comment on algal pigments.
- b) Briefly write on characters of Pyrrophyta.

Q4) Write short notes on any two of the following : **[16]**

- a) Sources of data for plant systematics.
- b) Position of algae in eight kingdom system.
- c) Habitat of Bryophytes.

P.T.O.

SECTION - II

Q5) Give an account of thallus structure and life cycle pattern in Oomycetes. [16]

Q6) Describe asexual and sexual reproduction in fungi. [16]

Q7) Write short answers of the following : [16]

- a) Describe Briefly write on - Saprotrophs and Biotrophs.
- b) Comment on Fungal sex hormones.

Q8) Write short notes on any two of the following : [16]

- a) Heterothallism.
- b) Calobryales.
- c) Sporophyte of Sphagnum.



Total No. of Questions : 8]

SEAT No. :

P483

[Total No. of Pages : 2

[4334] - 102

M.Sc. - I

BOTANY

BO - 1.2 : Plant Physiology and Biochemistry

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) Answer any Five questions, taking at least Two questions from each Section.*
- 2) Answer to the TWO sections should be written in SEPARATE answer books.*
- 3) All questions carry EQUAL marks.*
- 4) Neat diagrams must be drawn WHEREVER necessary.*

SECTION - I

Q1) Explain C₄ cycle and add a note on its significance.

Q2) Give an account on electron transport system in plant mitochondria. Add a note on cyanide resistant pathway.

Q3) Explain :

- a) Mechanism of action of Gibberellins.
- b) Signal transduction in guard cells.

Q4) Write short notes on any two of the following :

- a) Phloem loading and unloading.
- b) Drought stress.
- c) Biosynthesis of auxin.

P.T.O.

SECTION - II

Q5) Explain biosynthesis of alkaloids.

Q6) Define enzymes. Explain enzyme kinetics with the help of Michaelis - Menton equation.

Q7) Explain :

- a) Tertiary and quaternary structure of protein.
- b) Classification of carbohydrates.

Q8) Write short notes on any two of the following :

- a) Ramchandran plot.
- b) Dissociation and Association constants.
- c) Root nodules in leguminous plants.



Total No. of Questions : 8]

SEAT No. :

P484

[Total No. of Pages : 2

[4334] - 103

M.Sc. - I

BOTANY

BO - 1.3 : Principles of Genetics and Plant Breeding

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least Two questions from each Section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What is cytoplasmic inheritance. How it differs from Mendelian inheritance? Explain with examples.

Q2) What is tetrad analysis? Describe the ordered and unordered tetrad analysis in yeast.

Q3) Give an account of :

- a) Mendelian and post Mendelian genetics.
- b) Inheritance of quantitative characters in Nicotiana.

Q4) Write notes on any two of the following :

- a) Factors affecting Hardy-Weinberg equilibrium law.
- b) Mitochondrial genome.
- c) Gene maps and physical maps.

P.T.O.

SECTION - II

Q5) Define inversion and translocation. Explain cytological consequences of crossing over in inversion and translocation of heterozygotes.

Q6) Enlist different types of physical and chemical mutagens and their mechanism of action. Add a note on its importance in Plant Breeding.

Q7) Comment on :

- a) Genetic basis of Plant Breeding.
- b) Molecular basis of gene mutations.

Q8) Write short notes on (Any Two) :

- a) Inbreeding depression.
- b) Concept of biodiversity conservation and regulation.
- c) Role of polyploidy in crop improvement.



Total No. of Questions : 8]

SEAT No. :

P485

[Total No. of Pages : 2

[4334] - 201

M.Sc. - I (Semester - II)

BOTANY

BO - 2.1 : Systematics of Vascular Plants

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least Two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Give comparative account of morphology and anatomy of ophioglossales.
Add a note on affinities with others. **[16]**

Q2) "Gymnosperms as prospective ancestor of angiosperms". Discuss. **[16]**

Q3) Explain : **[16]**

- a) Strobilus in selaginella.
- b) Homosporous pteridophytes.

Q4) Write notes on any two of the following : **[16]**

- a) Anamalous sec. growth in gnetales.
- b) Stelar evolution.
- c) Ephedra - Male and Female cones.

P.T.O.

SECTION - II

Q5) Give an outline of Cronquist system of classification. Add a note on its merits and demerits. **[16]**

Q6) Explain role of phytochemistry in systematics. **[16]**

Q7) Comment on : **[16]**

- a) Angiosperms as highly evolved and dominant group of plants.
- b) Ecads and Ecotypes.

Q8) Write notes on the following (Any Two) : **[16]**

- a) Field and Library tools in taxonomy.
- b) Genome analysis in systematics.
- c) Systematic position of Paeonia.



Total No. of Questions : 8]

SEAT No. :

P486

[Total No. of Pages : 2

[4334] - 202

M.Sc. (Semester - II)

BOTANY

BO - 2.2 : Cell Biology and Instrumentation

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least Two questions from each Section.*
- 2) *Answer to the two Sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) How the cell is organized in plants. **[16]**

Q2) a) Explain biogenesis of plasmamembrane. **[8]**

b) Describe ultra structure and functions of golgi complex. **[8]**

Q3) a) Give an account of Gaint chromosome. **[8]**

b) Explain the role of plant vacuole. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

- a) Malignant growth.
- b) Cyclin dependent kinases.
- c) Cytoplasmic matrix.

P.T.O.

SECTION - II

- Q5)** What is centrifugation? Explain different types of rotors. [16]
- Q6)** a) Give an account of UV spectroscopy. [8]
b) What is micrometry? Add a note on its applications. [8]
- Q7)** a) Explain principles and application of AAS spectroscopy. [8]
b) Explain plant wound signaling pathway. [8]
- Q8)** Write explanatory notes on any two of the following : [16]
- a) Scintillation Counting.
 - b) HPLC.
 - c) Microtomy.



Total No. of Questions : 8]

SEAT No. :

P487

[Total No. of Pages : 2

[4334] - 203
M.Sc. (Semester - II)
BOTANY
BO - 2.3 : Molecular Biology & Genetic Engineering
(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) Answer any Five questions, selecting at least Two questions from each Section.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) All questions carry EQUAL marks.*
- 4) Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Describe the process of transcription in eukaryotes. **[16]**

Q2) Explain in detail the mechanism of replication in eukaryotes. **[16]**

Q3) a) Discuss the DNA repair systems. **[8]**

b) Explain organization and structure of eukaryotic genes. **[8]**

Q4) Write notes on any two of the following : **[16]**

- a) Southern blotting.
- b) Restriction endonucleases.
- c) Structure of tRNA.

P.T.O.

SECTION - II

- Q5)** Describe the mechanism of protein synthesis in eukaryotes. **[16]**
- Q6)** Explain in detail steps involved in DNA cloning. Add a note on applications of DNA cloning. **[16]**
- Q7)** a) Explain BAC and YAC vectors as cloning vectors. **[8]**
b) Explain polymerase chain Reaction and its applications. **[8]**
- Q8)** Write notes on any two of the following : **[16]**
- a) Eukaryotic transcription factors.
 - b) Differences in B and Z form of DNA.
 - c) Structure of mRNA.



Total No. of Questions : 8]

SEAT No. :

P488

[Total No. of Pages : 2

[4334]-301

M.Sc. II (Semester - III)

BOTANY

BO - 3.1 : Developmental Botany and Plant Tissue Culture

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least Two questions from each Section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Explain the steps involved in seed germination leading to establishment of seeding organ.

Q2) Explain :

- a) Histological changes in vegetative plant body during transition from vegetative to reproductive phase.
- b) Development of Ovule.

Q3) Describe :

- a) Pollen - stigma interactions.
- b) Shoot initiation and development of cotyledons.

Q4) Write short notes on any two :

- a) Light mediated regulation of reproductive development.
- b) Gene expression during flowering.
- c) Molecular basis of leaf development.

P.T.O.

SECTION - II

Q5) What is callus culture? Explain the factors affecting and application of callus culture.

Q6) Describe the protocol for inducing somatic embryogenesis. Comment on factors affecting somatic embryogenesis.

Q7) Explain :

- a) Explain the different methods of protoplast fusion.
- b) Comment on significance of anther culture.

Q8) Write notes on any two :

- a) Cyto differentiation.
- b) Embryo rescue.
- c) Somatic hybrids.



Total No. of Questions : 8]

SEAT No. :

P489

[Total No. of Pages : 2

[4334] - 302

M.Sc. - II

BOTANY

BO - 3.2 : Environmental Botany & Plant Diversity

(2008 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least Two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Explain the environmental science as an interdisciplinary science. Add a note on its scope and necessity.

Q2) What are biogeochemical cycles? Give details of nitrogen and carbon cycle.

Q3) a) Describe causal factors and ecological impact of acid rain.
b) Define endemism. Explain types of endemics.

Q4) Write notes on any two :

- a) Natality and mortality.
- b) Eutrophication.
- c) Kyoto protocols.
- d) Water Pollution Acts.

P.T.O.

SECTION - II

Q5) What is EIA? Give its concept, scope, process and necessity. Add a note on case study as irrigation project.

Q6) Define biodiversity. Describe methods of measuring biodiversity.

Q7) a) Explain factors affecting diversity.

b) Comment on principles of ecological succession in restoration ecology.

Q8) Write notes on any two :

a) Ecological effect of heavy metals.

b) Physiognomy.

c) Biodiversity Act.

d) Sources and types of soil pollutants.



Total No. of Questions : 8]

SEAT No. :

P490

[Total No. of Pages : 2

[4334] - 304

M.Sc. - II (Semester - III)

BOTANY

BO - 3.32 : Mycology and Plant Pathology - I

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least TWO questions from each Section.*
- 2) *Answer to the TWO sections should be written in SEPARATE answer books.*
- 3) *All questions carry EQUAL marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary.*

SECTION - I

Q1) What are Loculoascomycetes? Discuss concept of centrum with examples in Loculoascomycetes. [16]

Q2) Write short answers of the following : [16]

- a) Briefly write on morphological diversity in Lichen thallus.
- b) Give Webster's classification of Fungi.

Q3) Give an account of Teliomycetes and differentiate between rusts and smuts. [16]

Q4) Write short notes on any two of the following : [16]

- a) Net Slime molds.
- b) Contributions of Anton de Bary and Prevost.
- c) Peronosporales.
- d) Conidiomata.

P.T.O.

SECTION - II

Q5) What are Fungal habitats? Discuss different colonization strategies among Fungi. Add a note on seed borne Fungi. **[16]**

Q6) Write short answers of the following : **[16]**

- a) Briefly write on mycorrhizae.
- b) Comment on heterothallism.

Q7) How fungi act as tools of genetical studies? Comment on genetical aspects of pathogenicity, host resistance and virulence. **[16]**

Q8) Write short notes on any two of the following : **[16]**

- a) Fungal sex hormones.
- b) Soil fungi.
- c) Fungal carbon nutrition.
- d) Rhizosphere fungi.



Total No. of Questions : 8]

SEAT No. :

P491

[Total No. of Pages : 2

[4334] - 305

M.Sc. (Part - II) (Semester - III)

BOTANY

BO - 3.33 : Angiosperms

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any FIVE questions, taking at least two questions from each section.*
- 2) *Answer to the TWO sections should be written in SEPARATE answer books.*
- 3) *All questions carry EQUAL marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary.*

SECTION - I

Q1) "Systematics as a synthetic subject". Discuss.

Q2) Explain :

- a) What is ICBN? Add a note on its principles.
- b) Procedure for describing new genus and species.

Q3) "Botanical gardens as multipurpose resource institute". Explain.

Q4) Write notes on (Any Two) :

- a) Role of Catkin inflorescence in taxonomy.
- b) Major herbaria of India.
- c) Botanical gardens of India.

P.T.O.

SECTION - II

Q5) What is Biosystematics? Describe the methods of Biosystematic investigations.

Q6) Explain :

- a) Role of floral pigments in systematics.
- b) Angiosperm diversity of westernghats.

Q7) “Herbarium as a multipurpose resource institute”. Discuss.

Q8) Write notes on (Any Two) :

- a) Typification.
- b) Embryological features of santalales.
- c) Organization, units and facilities of Botanical gardens.



Total No. of Questions : 8]

SEAT No. :

P492

[Total No. of Pages : 2

[4334] - 306

M.Sc. - II (Semester - III)

BOTANY

BO - 3.34 : Plant Physiology - I

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any five questions, taking at least two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Explain the strategies adapted to overcome water stress.

Q2) Give an account of causes of water logging. Explain how it affects growth and metabolism.

Q3) Describe the injury effects caused by salt stress.

Q4) Write short notes on (Any Two) :

- a) Improvement of stress tolerance in plants at different center in India and abroad.
- b) Hyperaccumulation and stress tolerance.
- c) Effect of drought on metabolism.

P.T.O.

SECTION - II

Q5) Give an account of mechanism of ion stress tolerance.

Q6) Explain why UV-A and UV-B radiations affects plant metabolism? Give mechanism of UV tolerance.

Q7) Explain process of generation of free radicals. Add a note on scavenging of free radicals.

Q8) Write notes on (Any Two) :

- a) Air pollutants & their effects on plant metabolism.
- b) Toxicity of Manganese & Zinc.
- c) Morphological adaptations in plants under stress conditions.



Total No. of Questions : 8]

SEAT No. :

P493

[Total No. of Pages : 2

[4334] - 307

M.Sc. - II (Semester - III)

BOTANY

BO - 3.35 : Genetics, Molecular Biology and
Plant Breeding - I

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, taking atleast two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What are chromosomal markers? Comment on any four types of chromosomal markers with their applications.

Q2) a) Write role of recA, recACD enzymes in the mechanism of crossing over.
b) Write on different types of chromosomal banding pattern.

Q3) a) Give fine structure of rIII locus in T4 phage.
b) Explain the concept of linkage with suitable example.
c) Describe the importance of haploids in plant breeding.

Q4) Write notes on any two of the following :

- a) Chi - square test.
- b) Allopolyploids.
- c) Gene disruption.

P.T.O.

SECTION - II

Q5) Give an account of production of hybrid seeds using cytoplasmic male sterility.

Q6) Comment on the method of chimera development and screening of mutants.

Q7) a) Comment on different evaluation techniques for yield and agronomic evaluation.

b) Write an account of chromosome mapping.

Q8) Write notes on any two of the following :

a) Evolution of Karyotype.

b) Factorial experimental designs.

c) Achievement of plant breeding.



Total No. of Questions : 8]

SEAT No. :

P494

[Total No. of Pages : 2

[4334] - 308

M.Sc. (Semester - III)

BOTANY

BO - 3.36 : Plant Biotechnology - I

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Attempt Five questions, of which at least two questions must be from each Section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *All questions carry equal marks.*

SECTION - I

Q1) Define somaclonal variations. How are they induced? Explain their method of selection and enlist their applications. **[16]**

Q2) a) Discuss the procedure and precautions necessary for effective management of equipment and biological materials in a plant tissue culture laboratory. **[8]**

b) Explain applications of somatic hybridization. **[8]**

Q3) a) Explain different factors influencing morphogenesis invitro. **[8]**

b) Describe the two types of establishment of cell suspension culture and give its applications. **[8]**

Q4) Write short notes on ANY TWO : **[16]**

a) Role of plant growth Regulators in PTC.

b) Applications of plant tissue culture.

c) History of Plant Biotechnology.

P.T.O.

SECTION - II

- Q5)** Define transgenic plants. Explain applications of transgenic plants in production of abiotic stress tolerant plants. **[16]**
- Q6)** a) What are somaclonal variations? Explain their role in plant biotechnology. **[8]**
b) Explain the steps and importance of cryopreservation in plant biotechnology. **[8]**
- Q7)** a) What are biofertilizers? Explain the role of mycorrhiza in agriculture biotechnology. **[8]**
b) Describe methods of improvement of quality of lipids and plant derived vaccines by using transgenic plants. **[8]**
- Q8)** Write short notes on ANY TWO : **[16]**
- a) Algal biofertilizers.
- b) Green house technology.
- c) Single cell proteins from Spirulina.



Total No. of Questions : 8]

SEAT No. :

P495

[Total No. of Pages : 2

[4334] - 309

M.Sc. - II (Semester - III)

BOTANY

BO - 3.37 : Plant Diversity

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least two questions from each Section.*
- 2) *Answer to the Two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagram must be drawn wherever necessary.*

SECTION - I

Q1) What is endemism? Give the details on biodiversity in India with respect to endemism.

Q2) Comment on :

- a) Origin of species and species concept.
- b) Methods of assessing and measuring biodiversity.

Q3) a) Describe spatial patterns of species diversity and add a note on centres of diversity.

- b) Describe species inventory and problems in inventorying species.

Q4) Write short notes on any two :

- a) Lichen diversity.
- b) Nature and origin of genetic variations.
- c) Levels of biodiversity.

P.T.O.

SECTION - II

Q5) Describe temperate forests and grassland ecosystem in detail.

Q6) Explain :

- a) Diversity in Domesticated species.
- b) Arid and semi-arid ecosystem.

Q7) Comment on :

- a) Species richness and abundance.
- b) Factors affecting species distribution.

Q8) Write short notes on any two :

- a) Genetic diversity verses transgenic organisms.
- b) Angiosperm diversity with reference to distribution.
- c) Diversity indices.



Total No. of Questions : 8]

SEAT No. :

P496

[Total No. of Pages : 2

[4334] - 310

M.Sc. - II (Semester - III)

BOTANY

BO - 3.38 : Seed Technology - I

(2008 Pattern) (Special Paper - I)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least two questions from each Section.*
- 2) *Answers to the TWO sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Describe the types of seed germination and factors affecting germination. [16]

Q2) Give an account on the entry points of seed infection and mechanism of seed transmission. [16]

Q3) What is seed dormancy? Give an account of it's relevance to seed production. [16]

Q4) Write short notes on any two of the following : [16]

- a) Goal and opportunities of seed technology.
- b) Seed health testing methods.
- c) Development of male gametophyte.

P.T.O.

SECTION - II

- Q5)** Describe life cycle of any one pest of sugarcane and add a note on damage caused by pest and it's control measures. **[16]**
- Q6)** Write the general principles of seed storage and explain the measures for pest and disease control in seed storage. **[16]**
- Q7)** Describe floral biology of any two crops studied by you. **[16]**
- Q8)** Write short notes on any two of the following : **[16]**
- a) Insects as vectors of plant diseases.
 - b) Chemical composition of seed.
 - c) Production of disease free seed.



Total No. of Questions : 8]

SEAT No. :

P497

[Total No. of Pages : 2

[4334] - 401

M.Sc. (Semester - IV)

BOTANY

BO - 4.1 : Plant Resources & Evolution

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, taking atleast two questions from each Section.*
- 2) *Answer to the TWO sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What are plant resources? Describe spices, beverages, perfumery and latex with one suitable example. **[16]**

Q2) a) Give the importance of ethnobotany in Indian context. **[8]**

b) Enlist types of secondary metabolites and add a note on any one pharmacological activity of natural product. **[8]**

Q3) a) Comment on the role of Morphology and anatomy in forensic Botany. **[8]**

b) Write in brief on microscopic method in standardization of crude drugs. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Allopatric and sympatric evolution.

b) Cordaitales.

c) Lamarckism.

P.T.O.

SECTION - II

- Q5)** Comment & give an account of calamitales and pentoxylales with suitable examples. [16]
- Q6)** a) Write in brief on concept of Opairn and Halden. [8]
b) Comment on Molecular divergence and Molecular clock. [8]
- Q7)** a) Give Botanical source, plant part used chemical constituents and therapeutic uses of leaf drugs. [8]
b) Comment on evolution of prokaryotic cells. [8]
- Q8)** Write notes on any two of the following : [16]
- a) Vavilov's centers of origin.
b) Darwin's concept of evolution.
c) Phytochemical methods of carbohydrates.



Total No. of Questions : 8]

SEAT No. :

P498

[Total No. of Pages : 2

[4334] - 402

M.Sc. - II (Semester - IV)

BOTANY

BO - 4.2 : Applied Botany

(2008 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Give principles, methodology, necessity and applications of seaweed technology. **[16]**

Q2) a) Comment of algae as indicators of water quality. **[8]**

b) What are BGA? Give commercial applications of BGA. **[8]**

Q3) a) What are antibiotics? Add a note on production of fungal antibiotics. **[8]**

b) Explain production of vitamins and growth regulators from fungi. **[8]**

Q4) Write notes on any two : **[16]**

a) Mycoinsecticides.

b) Role of fungi in paper industry.

c) Fungi in treatment of effluents.

P.T.O.

SECTION - II

- Q5)** What is systemic mycosis? Explain ringworm and mycetoma. [16]
- Q6)** a) Give role of fungi in ayurvedic and homeopathic medicines. [8]
b) Briefly write on chi-square test. [8]
- Q7)** a) Give difference between parametric and non-parametric statistics. [8]
b) What is probability distribution? [8]
- Q8)** Write explanatory notes on any two : [16]
- a) Internet searches and nature of biological data.
 - b) Bibliographic databases and text based searching.
 - c) Importance of bioinformatics.



Total No. of Questions : 8]

SEAT No. :

P499

[Total No. of Pages : 2

[4334] - 403

M.Sc. - II (Semester - IV)

BOTANY

BO - 4.41 : Phycology - II

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Describe the materials, methods and isolation techniques used in culturing of algae in laboratory. [16]

Q2) a) Describe the mass multiplication of spirulina. [8]

b) Describe different methods adopted for maintenance of algal cultures. [8]

Q3) Explain the processing nutrition yield and quality standard of any red algae for its large scale cultivation. [16]

Q4) Write short notes on any two of following : [16]

- a) Strain selection.
- b) Measurement of algal growth.
- c) Agarophytes.

P.T.O.

SECTION - II

- Q5)** Describe the role of algae in sewage disposal, textile and effluent sugar industry. [16]
- Q6)** a) Describe different types of phycocolloids and its uses. [8]
b) Explain how algae are used in hydrocarbon production. [8]
- Q7)** a) Describe the role of algae in biotechnology as a source of PUFA, enzymes and chemicals. [8]
b) Describe in brief technique of tissue culture for marine macroalgae. [8]
- Q8)** Write short notes on any two of the following : [16]
- a) Seaweed liquid fertilizers.
b) SCP.
c) Secondary Metabolites.



Total No. of Questions : 8]

SEAT No. :

P500

[Total No. of Pages : 2

[4334] - 404

M.Sc. (Semester - IV)

BOTANY

BO - 4.42 : Mycology and Plant Pathology - II

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any Five questions, selecting at least two questions from each Section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Give difference between submerged and shallow fermentation processes.
Discuss use of fungi in brewing and wine industry. **[16]**

Q2) a) Comment on antitumour and antiviral agents from fungi. **[8]**

b) Explain role of fungi as mycofungicides and mycoinsecticides. **[8]**

Q3) a) How fungi are used in coal solubalization and as novel fungal textiles. **[8]**

b) Comment on role of fungi in mineral biotechnology and particulate adsorption. **[8]**

Q4) Write explanatory notes on any two : **[16]**

a) Endomycorrhiza and its applications.

b) Fungi in bioremediation.

c) Fungi in treatment of industrial effluents and lignocellulosic conversion.

P.T.O.

SECTION - II

- Q5)** Differentiate between systemic and superficial mycoses? Comment on symptoms, causal organisms and clinical aspects of Aspergillosis and Candidiasis. [16]
- Q6)** a) Briefly write on any four symptoms of plant diseases with examples. [8]
b) Give general steps in pathogenesis. [8]
- Q7)** a) Differentiate between rusts and smuts and comment on disease cycle in smuts. [8]
b) Describe any one leaf spot disease. [8]
- Q8)** Write explanatory notes on any two : [16]
a) Contributions of Tillet and Thirumalachar.
b) Wilts.
c) Physiology of diseased plants.



Total No. of Questions : 8]

SEAT No. :

P501

[Total No. of Pages : 2

[4334] - 405

M.Sc. - II (Semester - IV)

BOTANY

BO - 4.43 : Angiosperms - II
(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any five questions, selecting at least two questions from each Section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What is arboriculture? Describe arborescence as a growth type concept. Add a note on scope of arboriculture. **[16]**

Q2) Explain :

- a) Steps involved in androgenesis. **[8]**
- b) Properties and uses of wood in relation of structure. **[8]**

Q3) Enlist major Indian timber trees. Describe uses of any three trees. **[16]**

Q4) Write explanatory notes on any two of the following : **[16]**

- a) Stages of micropropagation.
- b) Ultra structure and biochemistry of any one wood element.
- c) Organization and importance of arboretum.

P.T.O.

SECTION - II

- Q5)** What is pollen germination? Describe the factors affecting pollen germination in vitro. Add a note on pollen storage. [16]
- Q6)** What is mellitopalynology? Explain the complementarity between floral organization and pollinator. Add a note on bees as crop pollinators. [16]
- Q7)** a) Enlist the causes of pollen sterility. Explain any one of them. [8]
b) Describe artificial pollination in angiosperms. [8]
- Q8)** Write explanatory notes on any two of the following : [16]
- a) Causes of polyembryony.
- b) Pollen based industries and its products.
- c) Unifloral and multifloral honeys.



Total No. of Questions : 8]

SEAT No. :

P502

[Total No. of Pages : 2

[4334] - 406

M.Sc. (Semester - IV)

BOTANY

BO - 4.44 : Plant Physiology

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any five questions, selecting at least two questions from each Section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Give an account of photochemical reaction. **[16]**

Q2) a) Write in brief about photorespiration. **[8]**

b) Explain the synthesis and degradation of carotenoids. **[8]**

Q3) a) How photosynthesis affects the crop yield? **[8]**

b) Explain the effect of global warming on NAR. **[8]**

Q4) Write in brief on any two of the following : **[16]**

- a) Green house gases.
- b) Climate change.
- c) Concept of crop physiology.

P.T.O.

SECTION - II

- Q5)** Explain the effect of allelo chemicals on plant metabolism. [16]
- Q6)** a) Explain effect of bacterial interaction on plant metabolism. [8]
b) How fungi interact with the plants. [8]
- Q7)** a) Explain the defence mechanism of plants with respect to structural modifications. [8]
b) What is SAR ? [8]
- Q8)** Write in brief on any two of the following : [16]
- a) Bt - Brinjal.
- b) Phyto chromes.
- c) Induction of flowering by light.



Total No. of Questions : 8]

SEAT No. :

P503

[Total No. of Pages : 2

[4334] - 407

M.Sc. (Semester - IV)

BOTANY

BO - 4.45 : Genetics Molecular Biology & Plant Breeding - II

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions carry equal marks.*
- 2) *Attempt five questions, with atleast two questions from each Section.*
- 3) *Draw neat labelled diagrams wherever necessary.*

SECTION - I

Q1) Differentiate in detail genetic & physical mapping. [16]

Q2) a) Explain fluorescent in situ hybridization. [8]

b) Discuss DNA fingerprinting & its applications. [8]

Q3) a) What is genome size? Add a note on mitochondrial genome. [8]

b) Write in brief principle & applications of AFLP. [8]

Q4) Write in short notes on any two of the following : [16]

a) Amplification of plasmid DNA.

b) RT - PCR.

c) Labelling nucleic acid.

P.T.O.

SECTION - II

- Q5)** What are the effects of drought on plant growth & development. [16]
- Q6)** a) What are quality traits? Add a note on nutritional quality traits. [8]
b) What are wild relatives? How are they used for breeding. [8]
- Q7)** a) Give an account of antinutritional factors in crop plants. [8]
b) What is amino acid balance? Explain with examples of crops. [8]
- Q8)** Write notes on any two of the following : [16]
- a) Fatty acid biosynthesis.
 - b) Selection & its applications.
 - c) Eucric acid crops.



Total No. of Questions : 8]

SEAT No. :

P504

[Total No. of Pages : 2

[4334] - 408

M.Sc. (Semester - IV)

BOTANY

BO - 4.46 : Plant Biotechnology - II

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Attempt a total of five questions, from the following selecting at least two questions from each Section.*
- 2) *Answers to the questions from each Section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What are Plasmid vectors? Explain their role in gene cloning. [16]

Q2) a) Give applications of PCR. [8]

b) Explain structural genomics. [8]

Q3) a) Explain shot gun sequencing. [8]

b) What is DNA polymorphism? Explain different types. [8]

Q4) Write explanatory notes on any two of the following : [16]

a) Nodule formation in biological nitrogen fixation.

b) Micro - array.

c) Sanger's sequencing method.

P.T.O.

SECTION - II

Q5) Define genomics. Explain sequencing strategies for whole genome analysis. **[16]**

Q6) a) Describe economic and legal issues of transgenic crops. **[8]**

b) Define phyto remediation. Explain its role in pollution control. **[8]**

Q7) Discuss various applications of agricultural biotechnology. **[16]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Characterization of novel proteins.

b) DNA libraries.

c) Nod genes.



Total No. of Questions : 8]

SEAT No. :

P505

[Total No. of Pages : 2

[4334] - 409

M.Sc. (Semester - IV)

BOTANY

BO - 4.47 : Plant Biodiversity

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any five questions, taking at least two questions from each Section.*
- 2) *Answers to the two Sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagram must be drawn wherever necessary.*

SECTION - I

Q1) What is ex-situ conservation? Add a note on the types of ex-situ conservation. [16]

Q2) Explain factors affecting ecosystem degradation and loss. Add a note on reasons for loss of biodiversity of mangrove ecosystem. [16]

Q3) Explain : [16]

- a) Role of UNEP and FAO in plant diversity management.
- b) ITTA and ITTO.

Q4) Write notes on any two of the following : [16]

- a) Chipko Movement.
- b) DNA Banks.
- c) Metapopulation concept.

P.T.O.

SECTION - II

- Q5)** Explain ethical and aesthetic values of biodiversity and write a note on participatory management of biodiversity. **[16]**
- Q6)** Give role of biotechnology in utilization of biodiversity. Add a note on impact of biological invasions on human health. **[16]**
- Q7)** Comment on : **[16]**
- a) Metadatabases and virtual libraries.
 - b) IPR's and ownership of traditional knowledge.
- Q8)** Write notes on any two of the following : **[16]**
- a) Role of biotechnology in assessment of biodiversity and bioresources.
 - b) Plant biodiversity as a source of clean development mechanism.
 - c) Plant biodiversity as a source of carbon sequestration.



Total No. of Questions : 8]

SEAT No. :

P506

[Total No. of Pages : 2

[4334] - 410

M.Sc. - II (Semester - IV)

BOTANY

BO - 4.48 : Seed Technology - II

(2008 Pattern) (Special Paper - II)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *Answer any five questions, selecting at least two questions from each section.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Give an brief account of seed production of wheat and groundnut. [16]

Q2) Explain :

- a) Stages of seed production and classes of seeds. [8]
- b) Seed production in tomato. [8]

Q3) a) Describe concept and objectives of seed processing. [8]

b) Explain methods of grading of seeds. [8]

Q4) Write short notes on any two of the following : [16]

- a) Release of new variety.
- b) True potato seed (TPS) production.
- c) Seed drying.

P.T.O.

SECTION - II

- Q5)** Give general layout of seed processing unit. Add a note on importance of seed treatment. **[16]**
- Q6)** Explain the methods of genetic purity and quality testing of seeds. **[16]**
- Q7)** What are the power & duties of seed inspector? Add a note on specific certification standards. **[16]**
- Q8)** Write short notes on any two of the following : **[16]**
- a) Concept of artificial seed production.
 - b) DNA finger printing.
 - c) ELISA test.

