

Total No. of Questions :8]

SEAT No. :

P2118

[Total No. of Pages :2

[5329] - 11

M.Sc. - I

BOTANY

BO - 1.1 : Systematics of Non Vascular Plants

(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) Explain thallus organization in phaeophyta and comment on life cycle pattern in rhodophyta. **[16]**

Q2) Describe external morphology and internal structure of sporophyte of order polytrichales. **[16]**

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

- a) Comment on reserve food and pigments in algae.
- b) Write evolutionary trends among algae.

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

- a) Algal habitats.
- b) Zygnemetales.
- c) Sporophyte of porella.

P.T.O.

SECTION - II

- Q5)** Give an account of thallus structure spore producing structure and life cycle pattern in plasmodiophoromyetes. **[16]**
- Q6)** Give an outline classification of fungi as per Ainsworth. Add a note on necrotrophs. **[16]**
- Q7)** Write short answers of the following: **[16]**
- a) Comment on fungal sex hormones.
 - b) Sporangial evolution in mucorales.
- Q8)** Write short notes on any two of the following: **[16]**
- a) Fruit bodies in deuteromycotina.
 - b) Takakiales.
 - c) Economic importance of bryophytes.



Total No. of Questions : 8]

SEAT No :

P 2119

[5329]-12

[Total No. of Pages : 2

M.Sc. - I

BOTANY

**BO - 1.2 : Plant Physiology & Biochemistry
(2008 Pattern) (Semester - 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 on separate answer books.*
- 3) All questions carry equal marks.*
- 4) Neat labelled diagram must be drawn wherever necessary.*

SECTION - I

Q1) Explain regulation of Calvin cycle. Add a note on photoinhibition of O₂.

Q2) Comment on defense mechanism during biotic stress in plant.

Q3) Explain

- a) Signal transduction in guard cells.
- b) ATP synthesis.

Q4) Write notes on (any two)

- a) Light harvesting complex.
- b) Action mechanism of cytokinins.
- c) Cyanide resistance pathway.

P.T.O.

SECTION - II

Q5) Discuss different structures of proteins.

Q6) Give biosynthetic pathway of carotenoids and Anthocyanins.

Q7) Explain:

- a) Enzyme inhibition.
- b) β - oxidation of fatty acids.

Q8) Write notes on Any Two

- a) Biosynthesis of starch.
- b) Symbiotic nitrogen fixation.
- c) Classification of amino acids.

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Total No. of Questions :8]

SEAT No :

[Total No. of Pages :2

P 2120

[5329]-13

M.Sc. - I

BOTANY

**BO-1.3 : Principles of Genetics and Plant Breeding
(2008 Pattern) (Semester - I) (Credit System)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION-I

Q1) Define Hardy weinberg law. Explain various factors affecting it.

Q2) Explain gene mapping in yeast.

Q3) Give an account of :

- a) Multiple factors hypothesis and heritability.
- b) Lethal and additive interactions of genes.

Q4) Write notes on any two of the following :

- a) Quantitative and qualitative traits.
- b) Polymerit interaction genes.
- c) Three point Test cross.

P.T.O.

SECTION-II

Q5) Comment on physical and chemical mutagens. Explain their mechanism of action.

Q6) Comment on incompatibility. Discuss its types.

Q7) Comment on :

- a) Aneuploidy and its importance.
- b) Genetic diversity in plants.

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

- a) Pre and post mendalian development.
- b) Hybridization and its role.
- c) Chromosome markers.

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Total No. of Questions :8]

SEAT No. :

P2121

[5329]-21

[Total No. of Pages : 2

M.Sc.-I

BOTANY

**Bo-2.1 : Systematics of Vascular Plants
(2008 Pattern) (Semester-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 on separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat labelled diagram must be drawn wherever necessary.*

SECTION-I

Q1) Give comparative account of morphology and anatomy of sporophyte in Filicales.

- Q2)** a) Describe structure of sporophytes in Coniferales.
b) Comment on field and library tools of taxonomy.

Q3) Attempt Any Two of the following :

- a) Write the structure of sporophyte of Ophioglossales.
- b) Discuss the merits and limitations of Cronquist's system of Angiosperms classification.
- c) Explain synthetic approach of palynology in Angiosperms.

Q4) Write note on Any Two :

- a) Sporophyte of Ginkgoales
- b) Plant body Organization in Gymnosperms
- c) Ecads and ecotypes

P.T.O.

SECTION-II

Q5) Give detail account of Dahlgrens system of classification of Angiosperms.

- Q6)** a) Describe alternation of generations in Pteridophytes.
b) Explain sporophyte of Welwitschiales.

Q7) Attempt Any Two of the following :

- a) Write comparative account of gametophytes of Equisetales and Lycopodiales.
b) Describe life cycle pattern in Gymnosperms.
c) Comment on taxonomic hierarchy.

Q8) Write note on (Any two) :

- a) Liliopsida
b) Phytochemistry : Synthetic approach
c) Sporophyte of Osmundales
d) Gnetales



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P2122

[5329]-22

M.Sc. - I

BOTANY

**BO - 2.2 : Cell Biology and Instrumentation
(2008 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION - I

Q1) Discuss biogenesis, ultrastructure and functions of plasma membrane. [16]

Q2) a) Describe the organization of nucleosome. [8]

b) Explain in brief the process of meiosis. [8]

Q3) a) Describe ethylene activated two component signalling pathway. [8]

b) Comment on the ultrastructure and functions of vacuoles. [8]

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

- a) Cell wall.
- b) Cytoplasmic matrix.
- c) Dosage compensation.
- d) Plant photoproteins.

P.T.O.

SECTION - II

- Q5)** What is Raman spectroscopy? Explain the principle of operation of Raman spectrometer and a note on its applications. [16]
- Q6)** a) What is micrometry? Explain its procedure and add a note on its applications. [8]
b) Explain the technique of native gel electrophoresis. [8]
- Q7)** a) Describe the composition and functions of eukaryotic ribosomes. [8]
b) Write the ultrastructure and functions of nucleus. [8]
- Q8)** Write explanatory notes on any two of the following: [16]
a) Gas chromatography.
b) Bench top centrifuges.
c) Paper chromatography.
d) Antigen-antibody interaction.



Total No. of Questions : 8]

SEAT No. :

P2123

[5329]-23

[Total No. of Pages : 2

M.Sc.

BOTANY

BO - 2.3: Molecular Biology and Genetic Engineering

(2008 Pattern) (Semester - 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) *Answer to the from each section should be writtein in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labeled diagram must be drawn whenever necessary.*

SECTION - I

Q1) What is transcription? Describe the process of transcription in prokaryotes. **[16]**

Q2) a) Describe the structure of eukaryotic promoter. **[8]**

b) Explain the eukaryotic DNA replication apparatus. **[8]**

Q3) a) What is operon? Describe the mechanism of induction and regulation of lac operon. **[8]**

b) State the mechanism of protein synthesis in prokaryotes. **[8]**

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

a) Excision repair of damaged DNA.

b) Chaperones.

c) Prokaryotic gene structure.

P.T.O.

SECTION - II

- Q5)** What is melting of DNA? Describe the concept of T_m value and add a note on factors affecting it. **[16]**
- Q6)** a) Write the structure of Ti plasmid. **[8]**
b) Give role of various enzymes used in genetic engineering. **[8]**
- Q7)** a) What is polymerase chain reaction? Explain its applications in genetic engineering. **[8]**
b) What are cloning vectors? Describe the structure of a bacteriophage used as a cloning vector. **[8]**
- Q8)** Write an explanatory notes on any two of the following. **[16]**
- a) Applications of genetic engineering.
b) C-DNA libraries.
c) Genomics.



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P2124

[5329] - 31

M.Sc. - II

BOTANY

**Bo - 3.1 : Developmental Botany and Plant Tissue Culture
(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) 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 intrinsic and extrinsic factors controlling plant development.

Q2) Explain:

- a) Process of development of stamen,
- b) Process of development of female gametophyte.

Q3) Write critically on:

- a) Parthenocarpy,
- b) Applications of developmental Botany.

Q4) Write short notes on (Any two)

- a) Embryogenesis.
- b) Androgenesis.
- c) Coordinated development.

P.T.O.

SECTION - II

Q5) Explain the enzymatic method used for isolation of protoplast. Give its advantages over the mechanical method. Add a note on protoplast culture.

Q6) Describe the different strategies applied for enhancement in production of secondary metabolites using in vitro cultures.

Q7) Explain:

- a) Why it is possible to develop triploid plants using tissue culture?
- b) Explain the first two stages of Micropropagation.

Q8) Write notes on. (Any two)

- a) GM crops.
- b) Selection methods for somaclones.
- c) Cytodifferentiation.



Total No. of Questions : 8]

SEAT No. :

P2125

[5329]-32

[Total No. of Pages : 2

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, 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) Define soil pollution. Enlists its sources and pollutants. Explain its impact on soil quality.

Q2) Explain structures of forest ecosystem.

- Q3)** a) Explain role of GPS in the study of environmental science.
b) What is acid rain? Comment on factors causing acid rain.

Q4) Write notes on any two:

- a) Speciation
- b) Ecological niche
- c) Natality and mortality

SECTION - II

Q5) What is basis for ecosystem diversification? Add a note on major ecosystems of the world.

P.T.O.

Q6) Give an account of different methods for conservation of biodiversity.

Q7) a) Explain functional aspects of community with respect to seasons.

b) Explain value and use of bio diversity with socioecological approach.

Q8) Write notes on any two:

a) Environmental (protection) Act.

b) EMP

c) Microbes for restoration ecology



Total No. of Questions :8]

SEAT No :

P 2126

[Total No. of Pages :2

[5329]-34

M.Sc.-II

BOTANY

**BO-3.32 : Mycology & Plant Pathology (Special Paper - I)
(2008 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least two questions from each sections.*
- 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 system of classification of fungi as per Bessey. State Its merits. [16]

Q2) What are Ascomycotina ? Add a note on concept of centrum in ascomycetes fungi. [16]

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

- a) Briefly comment on conidiomata,
- b) Comment on conidial evolution in Mycorales.

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

- a) Fruit bodies in Gasteromycetes.
- b) Rust fungi,
- c) Cellular slime molds
- d) Blastocladales

P.T.O.

SECTION-II

Q5) Discuss different aspects of heterothallism in Mycorales and Oomycetes. [16]

Q6) Describe in detail different colonization strategies among fungi. [16]

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

- a) Briefly write on rhizosphere fungi,
- b) Comment on algal and protozoan ancestry of fungi.

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

- a) Seed borne fungi,
- b) Sex hormones in fungi,
- c) Fungal carbon nutrition,
- d) Genetical aspects of pathogenecity & resistance.

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Total No. of Questions :8]

SEAT No :

[Total No. of Pages :2

P 2127

[5329]-35

M.Sc. (Part - II)

BOTANY

BO-3.33 : Angiosperms

(2008 Pattern) (Semester-III) (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 ICBN? Explain its Principles and Rules in detail.

Q2) Explain :

- a) Floristic composition of India with special reference to biodiversity of angiosperms,
- b) Typification.

Q3) Comment on :

- a) Amentiferae is not a primitive group,
- b) Multidisciplinary approach to systematics of Ranunculaceae.

Q4) Write short notes on (any two):

- a) Effective and valid publication,
- b) Procedure for describing new genus and species,
- c) Loranthaceae.

P.T.O.

SECTION-II

Q5) Give aims, objectives and procedures of Biosystematics investigation.

Q6) Describe:

- a) The role of embryology in systematics of angiosperms,
- b) Objectives and functions of herbarium.

Q7) What is botanical garden ? Give important features and functions of botanical garden.

Q8) Write short notes on (any two):

- a) Numerical taxonomy,
- b) Botanical garden of Kolkata,
- c) Digitized herbaria.

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Total No. of Questions :8]

SEAT No :

P 2128

[Total No. of Pages :2

[5329]-36

M.Sc.-II

BOTANY

BO-3.34 : Plant Physiology (Special Paper-I)

(2008 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least two questions from each sections.*
- 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 mechanism of salt tolerance in higher plants. **[16]**

Q2) a) Discuss the drought resistance mechanism in plants. **[8]**

b) Comment on recent research on stress physiology. **[8]**

Q3) a) Explain the mechanism of flooding tolerance in plants. **[8]**

b) Give an account of transgenics for drought stress tolerance. **[8]**

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

a) Scope of stress physiology.

b) Role of glycine betaine in water stress.

c) Salt stress

P.T.O.

SECTION-II

Q5) What is radiation stress? Explain the effects of radiation on plant metabolism. **[16]**

Q6) a) What is xenobiotic stress? Give scope and their importance. **[8]**

b) Explain mechanism of tolerance to ion stress. **[8]**

Q7) a) Give an account of photo inhibition. **[8]**

b) Write on free radicals generation and their effects on plant. **[8]**

Q8) Write short notes on (any two): **[16]**

a) Effects of Fe on plant metabolism

b) Reactive oxygen species.

c) Mechanism of UV tolerance.

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Total No. of Questions :8]

SEAT No :

[Total No. of Pages :2

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[5329]-37

M.Sc. - II

BOTANY

**BO-3.35 :Genetics, Molecular Biology & Plant Breeding-I
(2008 Pattern) (Semester - III) (Credit System)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least two questions from each sections.*
- 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) Discuss in detail the various morphological markers in chromosomes. [16]

Q2) a) Discuss the evolution in hexaploid wheat. [8]

b) Explain any one method of alien gene transfer. [8]

Q3) a) Explain any two methods of genetic recombination in bacteria. [8]

b) Explain the correlation between genetic and physical maps. [8]

Q4) Give a brief account of any two of the following : [16]

a) Null hypothesis.

b) Evolution in Karyotype,

c) Holiday junction.

P.T.O.

SECTION-II

- Q5)** Discuss any two methods of breeding in self-pollinated crops. Add a note on their merits & demerits. **[16]**
- Q6)** a) Explain the technique of hybridization in detail. Add a note on merits & demerits of hybrid varieties. **[8]**
b) Describe any one design for agronomic and yield evaluation of crops. **[8]**
- Q7)** a) Explain the types of mutagenic agents and the methods of treatments followed to induce mutations. **[8]**
b) Describe any two methods of breeding in vegetatively propagated plants. **[8]**
- Q8)** Write notes on any two of the following : **[16]**
- a) Types of correlations.
 - b) Centres of origin in crop plants.
 - c) Mechanism of seed multiplication.

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Total No. of Questions :8]

SEAT No :

P 2130

[Total No. of Pages :2

[5329]-38

M.Sc. - II

BOTANY

BO-3.36 : Plant Biotechnology-I

(2008 Pattern) (Semester - III) (Credit System)

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) Describe the factors considered during design of plant tissue culture laboratory.
Add a note on its operation and management.

- Q2)** a) What are the advantages and disadvantages of direct and indirect shoot organogenesis.
- b) Explain the two primary environmental factors that must be regulated during acclimatization.

- Q3)** a) Explain why stock solutions are prepared for plant tissue culture media.
- b) Describe the factors influencing induction of somatic embryogenesis.

Q4) Write notes on (Any two):

- a) Applications of cell culture,
- b) Selection of somaclones,
- c) Meristem culture.

P.T.O.

SECTION-II

- Q5)** Explain with suitable examples, the application of transgenics in quality improvement of proteins.
- Q6)** a) Describe the manipulation of photosynthesis or nitrogen fixation to increase the productivity.
b) Comment on production of haploids and their role in plant breeding.
- Q7)** a) Explain importance of cryopreservation in plant biotechnology.
b) What is Green house technology? Explain its operation and maintainance.
- Q8)** Write notes on (any two)
- a) Phytoremediation,
 - b) Abiotic stress tolerance in transgenic crop plants,
 - c) Somaclones.

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Total No. of Questions :8]

SEAT No :

[Total No. of Pages :2

P 2131

[5329]-39

M.Sc.

BOTANY

**BO-3.37 : Plant Diversity - I
(2008 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least Two questions from each sections.*
- 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) Enlist major ecosystems of the world and describe in detail arctic and freshwater wetland systems.

Q2) Comment on :

- a) Endemism and Biodiversity,
- b) Angiosperm diversity with reference to habit.

Q3) a) Explain Diversity indices,

- b) Comment on act of domestication.

Q4) Write short notes on (Any two):

- a) Micro and macroevaluation,
- b) Levels of Biodiversity,
- c) Nature and origin of genetic variation.

P.T.O.

SECTION-II

- Q5)** a) What are the problems of inventorying species?
b) Describe in brief species richness and species abundance.

Q6) Explain:

- a) Current magnitude of plant diversity,
b) Microbial diversity with reference to habit and habitat.

Q7) Comment on :

- a) Marine ecosystems,
b) Darwin evidence for natural selection.

Q8) Write short notes on (any two)

- a) Global distribution of species richness,
b) Concept of Biodiversity,
c) Methods of measuring biodiversity.

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Total No. of Questions :8]

SEAT No :

[Total No. of Pages :2

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[5329]-40

M.Sc. - II

BOTANY

**BO-3.38 : Seed Technology (Special Paper-I)
(2008 Pattern) (Semester - III) (Credit System)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any Five questions, taking at least two questions from each sections.*
- 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) Define seed. Describe the ultrastructure of seed.

Q2) Explain :

- a) Structure of megasporangium,
- b) Quality characters of seeds.

Q3) Describe:

- a) Integrated management of seed borne diseases,
- b) Quarantine regulations for seeds.

Q4) Write short notes on (Any two):

- a) Floral biology of different crops,
- b) Pests of Rabi Crops,
- c) Female gametophyte.

P.T.O.

SECTION-II

Q5) Describe seed borne diseases and add a note on its control measures.

Q6) Comment on :

- a) Seed borne pathogens,
- b) Seed storage,

Q7) Explain Factors affecting longevity of seeds in storage.

Q8) Write short notes on (Any two):

- a) Seed dormancy,
- b) Seed certification,
- c) Physiological changes during seed germination.

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Total No. of Questions :8]

SEAT No. :

P2133

[5329]-41

[Total No. of Pages : 2

M.Sc.-II

BOTANY

**BO-4.1 : Plant Resources and Evolution
(2008 Pattern) (Semester-IV)**

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 separate answer book.*
- 3) All questions carry equal marks.*
- 4) Neat diagram must be drawn whenever necessary.*

SECTION-I

Q1) Explain plants as source of food, fodder, and fiber with suitable examples.

Q2) Comment on “Vavilov’s centers of origin”.

Q3) Explain :

- a) Pharmacological activity of natural products.
- b) Role of Botanical garden and herbaria.

Q4) Write note :

- a) Secondary metabolites
- b) Forensic Botany
- c) Plants in medicines

SECTION-II

Q5) Discuss the origin of Basic biological Molecules.

Q6) Explain the importance of molecular tool in modern phylogeny.

P.T.O.

Q7) Explain :

- a) Gene duplication and gene divergence.
- b) Origin of unicellular and multicellular organism

Q8) Write note on (Any two) :

- a) Speciation
- b) Molecular divergence
- c) Anaerobic metabolism



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P2134

[5329]-42

M.Sc. - II

BOTANY

BO - 4.2 : Applied Botany

(2008 Pattern) (Semester - IV) (Old Course)

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 labelled diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Describe in detail the necessity of sea farming. Add a note on its principles and methodology.

Q2) a) Give an account on submerged fermentation technology.

b) What is correlation? Describe its types with suitable example.

Q3) a) Give an account of fungi in mushroom production technology.

b) Comment on sea weeds and write a note on its applications.

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

a) Fungi as mycopesticides.

b) Nutritive value of Spiruling.

c) Fungi in homeopathic medicine.

SECTION - II

Q5) Explain :

a) Role of AM fungi in agriculture.

b) Applications of fungi in paper industry.

P.T.O.

Q6) What is ANOVA? Explain the procedure with suitable example. Add a note on its applications.

Q7) a) Give an account of protein sequence database.

b) Role of fungi as animal pathogens.

Q8) Write notes on any two:

a) Parametric test statistics.

b) Fungi in biosorption.

c) Algal blooms & algal nuisance.



Total No. of Questions : 8]

SEAT No. :

P2135

[5329]-44

[Total No. of Pages : 2

M.Sc.

BOTANY

**BO - 4.42: Mycology and Plant Pathology - II
(2008 Pattern) (Special Paper - II) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Attempt a total of Five questions from the following, select at least two questions from each section.*
- 2) *Answer to the questions from each section should be written on separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labeled diagrams must be drawn wherever necessary.*

SECTION - I

- Q1)** What are primary and secondary metabolites of fungal origin? Add a note on solid state and submerged fermentation. **[16]**
- Q2)** a) Comment on role of fungi in wine and brewing industry. **[8]**
b) Write on immunoregulators. **[8]**
- Q3)** a) Explain role of fungi in mineral biotechnology and fungal textiles. **[8]**
b) Discuss applications of mycorrhiza in agriculture. **[8]**
- Q4)** Write notes on any two: **[16]**
a) Mycofungicides and mycoweedicides
b) Ergot alkaloids
c) Antitumour and antiviral agents of fungal origin.

P.T.O.

SECTION - II

- Q5)** Discuss tinea and its clinical types. Add a note on aspergillosis. [16]
- Q6)** a) Write on harmful activities of fungi. [8]
b) Comment on any four fungal symptoms of diseases. [8]
- Q7)** a) Describe role of environment in plant diseases. [8]
b) Give an account of seed borne pathogens. [8]
- Q8)** Write an explanatory notes on any two of the following. [16]
a) Pathogenesis
b) Defense mechanisms in plants
c) Rusts & powdery mildews



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P2136

[5329]-45

M.Sc.-II

BOTANY

BO - 4.43 : Angiosperms

(2008 Pattern) (Old) (Semester- IV) (Special Paper -II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION - I

Q1) What is mellitopalynology? Write on Floral calender & Floral Fidelify. [16]

Q2) Explain arboretum. Give the criteria for selection of tree species for plantation. [16]

Q3) Explain:

- a) Ultrastructure of endosperm [8]
- b) Anatomical features of arborescent monocotyledons. [8]

Q4) Write notes on any two. [16]

- a) Polyembryony
- b) Gynogenesis
- c) Structure & organization of wood

P.T.O.

SECTION - II

Q5) Discuss the structure of wood element & distribution of element in L.S. or wood. **[16]**

Q6) What is apomixis? Comment on In Vitro Fertilization. **[16]**

Q7) Explain:

a) Somatic embryogenesis **[8]**

b) Pollen viability & pollen sterility **[8]**

Q8) Write notes on any two. **[16]**

a) UAM application

b) Experimental palynology

c) Unifloral & multifloral Honeys



Total No. of Questions : 8]

SEAT No. :

P2137

[5329]-46

[Total No. of Pages : 2

M.Sc. -II

BOTANY

BO - 4.44 : Plant Physiology

(2008 Pattern) (Semester IV) (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) *Answer to the two sections should be written on separate answer books.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Discuss the effect of global warming on NAR and plant metabolism. [16]

Q2) Explain the mechanism of biosynthesis and degradation of carotenoids. [16]

Q3) a) Write on changing scenario of climate and crop physiology. [8]

b) Explain effect of green house gases on NAR in plants. [8]

Q4) Write note on any two. [16]

a) Pigment organization in thylakoid

b) Photorespiration

c) Role of chlorophylls in plant.

P.T.O.

SECTION - II

Q5) Write effect of viral and mycoplasma infection on plant metabolism. [16]

Q6) Describe in detail chemical and structural defense mechanism in host plant. [16]

Q7) a) Give biochemical and photochemical properties of cryptochrome. [8]

b) Write effect of allelobiogenesis on plant metabolism. [8]

Q8) Write notes on any two. [16]

a) R-genes

b) Bt- cotton

c) Photoperiodism



Total No. of Questions : 8]

SEAT No. :

P2138

[5329]-47

[Total No. of Pages : 2

M.Sc.

BOTANY

**BO - 4.45 : Genetics, Molecular Biology and Plant Breeding - II
(2008 Pattern) (Old) (Semester IV)**

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) *Answer to the questions from each section should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labeled diagram must be drawn wherever necessary.*

SECTION - I

- Q1)** Give techniques of in vivo and in vitro DNA amplifications. Write a note on its applications. **[16]**
- Q2)** a) Explain mechanism of physical mapping. **[8]**
b) Describe method of plaque hybridization. **[8]**
- Q3)** a) Describe procedure and applications of Northern blotting. **[8]**
b) Write an account of genome project. **[8]**
- Q4)** Write notes on any two of the following. **[16]**
a) Chloroplast DNA
b) DNA sequencing
c) Reverse transcription

P.T.O.

SECTION - II

- Q5)** Describe procedure for breeding of drought resistance and drought hardening. Add a note on a relationship between drought resistance any yield. [16]
- Q6)** a) Write an account of breeding with reference to oil yield. [8]
b) Describe importance of legume protein improvement. [8]
- Q7)** a) Write an account of breeding methods and its approaches. [8]
b) Describe method for the development of somaclonal variants. [8]
- Q8)** Write an explanatory notes on any two of the following. [16]
- a) DNA finger printing.
 - b) Restriction mapping
 - c) Genetic variability and evolution.



Total No. of Questions : 8]

SEAT No. :

P2139

[5329]-48

[Total No. of Pages : 2

M.Sc. - II

BOTANY

**BO - 4.46: Plant Biotechnology
(2008 Pattern) (Paper - II) (Semester IV)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION - I

- Q1)** What is PCR? Describe w.r.t. principle methods & applications. **[16]**
- Q2)** a) Describe northern blotting technique. Write its applications. **[8]**
b) Explain use of any two vectors in gene cloning. Add examples. **[8]**
- Q3)** a) Discuss sequencing strategy for whole genome analysis. **[8]**
b) Give an account of proteomics methodologies. **[8]**
- Q4)** Write notes on any two of the following. **[16]**
- a) Chromosome jumping
 - b) Restriction endonucleases
 - c) Structural genomics

P.T.O.

SECTION - II

Q5) What is agriculture biotechnology? Explain its methods. Add a note on bioethical principles. **[16]**

Q6) a) Illustrate chemical method of DNA sequencing. **[8]**

b) Describe structural and functional proteomics. **[8]**

Q7) a) Write an account of use of microbes in leaching of metals. **[8]**

b) Mention applications of proteomics in screening of diagnostic markers. **[8]**

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

a) Genome annotation

b) DNA libraries.

c) Use of microbes in industry.



Total No. of Questions : 8]

SEAT No. :

P2140

[5329]-49

[Total No. of Pages : 2

M.Sc.

BOTANY

BO - 4.47: Plant Biodiversity - II
(2008 Pattern) (Special - II) (Semester - IV)

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 on separate answer books.*
- 3) *All question carry equal marks.*
- 4) *Neat diagram must be drawn wherever necessary.*

SECTION - I

- Q1)** Explain the causes of loss of species extinction. Add a note on the process responsible for species extinction. **[16]**
- Q2)** What is meant by ex-situ conservation. Add a note on the types of ex-situ conservation. **[16]**
- Q3)** Explain: **[16]**
- a) Loss of Agrobiodiversity
 - b) Organisations involved in Financing Biodiversity management.
- Q4)** Write explanatory notes on any two of the following. **[16]**
- a) Role of UNESCO and ISBI in plant diversity management.
 - b) IUCN threatened categories.
 - c) Participatory Forest Management.

P.T.O.

SECTION - II

Q5) Write uses of plants with respect to food, fodder, medicinal plants and timber. **[16]**

Q6) Write in brief about biological invasions and comment on its ecological and economic impacts. Add a note on role of biotechnology in assessment of biodiversity and bioresources. **[16]**

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

- a) Population size as a critical factor in species extinction.
- b) Emerging International policies.

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

- a) Biopiracy
- b) Plant biodiversity as a source for carbonsinks
- c) Metapopulation concept



Total No. of Questions : 8]

SEAT No. :

P2141

[5329]-50

[Total No. of Pages : 2

M.Sc.

BOTANY

BO - 4.48 : Seed Technology

(2008 Pattern) (Special Paper - II) (Old) (Semester - IV)

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 on separate answer books.*
- 3) *All questions carry equal marks.*

SECTION - I

Q1) Give brief account of seed production in cotton and brinjal.

Q2) a) Comment on characteristics and importance of quality seed.

b) Give an account of packaging and handling of seeds. Add a note on screw conveyor.

Q3) a) Explain history of vegetable seed industry.

b) Comment on principles, construction and working of electrostatic seed separators.

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

a) DNA finger printing.

b) Power and duties of seed inspector

c) Grow out test

P.T.O.

SECTION - II

Q5) Describe the methods of genetic purity and quality testing of seed.

- Q6)** a) Comment on seed certification board.
b) Give importance and advantages of precleaning.

- Q7)** a) Explain specific seed certification standards.
b) Describe construction and working of scalper and huller.

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

- a) Seed village concept
- b) Stages of seed production
- c) Artificial seeds.

