

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P3031**

**[5536]-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, 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)** Write the position of algae in eight Kingdom system and give classification of algae as per G.M. Smith. **[16]**

**Q2)** a) Give asexual reproduction in cyanophyta. **[8]**

b) Write the differences between structural systematics and molecular systematics. **[8]**

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

a) Comment on algal reserve food.

b) Write a note on algal pigments.

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

a) Habit and habitat of Bryophytes.

b) Internal structure of Marchantia thallus.

c) Gametophyte of Funaria.

*P.T.O.*

## SECTION - II

**Q5)** Give an account of Zygomycotina with reference to reproductive structures. [16]

- Q6)** a) Give an outline classification of fungi as per Alexopoulos et.al. [8]  
b) Give an account of spore producing organs in Basidiomycotina. [8]

**Q7)** Write short answers of the following : [16]  
a) Describe mycelium of fungi.  
b) Contribution of Ainsworth in fungi.

**Q8)** Write short notes on any two : [16]  
a) Economic significance of Bryophytes.  
b) Gametophyte of Sphagnum.  
c) Indian Bryology.



Total No. of Questions :8]

SEAT No. :

**P3032**

**[5536]-12**

[Total No. of Pages : 2

**M.Sc. -I**

**BOTANY**

**BO1.2 : Plant Physiology and Biochemistry  
(2008 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions taking atleast 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 diagram must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Give an account of cyanide resistance pathway. Add a note on TCA cycle.

**Q2)** Discuss.

- a) Metabolic changes during seed germination
- b) RUBISCO activity.

**Q3)** Explain.

- a) Phloem loading
- b) Signal transduction in guard cells.

**Q4)** Write notes on any two.

- a) CAM pathway.
- b) Biosynthesis of auxins
- c) Biotic stress

**SECTION-II**

**Q5)** Give an account of biosynthesis of phenolics.

**Q6)** Discuss.

- a) Secondary structure of protein.
- b) NOD factor and nif gene

***P.T.O.***

**Q7)** Explain:

- a) General classification of lipids.
- b) Breakdown of starch.

**Q8)** Write notes on any two.

- a) Enzyme inhibition
- b) Biosynthesis of carotenoids
- c) Michaelis-Menton equation.



Total No. of Questions :8]

SEAT No. :

**P3033**

**[5536]-13**

[Total No. of Pages :2

**M.Sc.- I**

**BOTANY**

**BO.1.3 : 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, taking atleast 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)** What is cytoplasmic inheritance? Explain the mechanism of cytoplasmic inheritance in *Mirabilis jalapa*.

- Q2)** a) Discuss on complementary gene interaction with suitable example.  
b) Give the concept and types of recombination.

**Q3)** Explain:

- a) Three point test cross.
- b) Inheritance of coblength in *zea mays*.

**Q4)** Write notes on (any two).

- a) C-value paradox.
- b) Continuous variation.
- c) Gene maps & physical maps.

***P.T.O.***

## SECTION-II

**Q5)** Give the classification of ploidy. Write on methods of inducing autopolyploidy.

**Q6)** a) What is combination breeding? Give applications of combination breeding.

b) Write on objectives of plant breeding.

**Q7)** Explain:

a) Molecular basis of gene mutation

b) Asexual reproduction modes in crop plants.

**Q8)** Write notes on (any two)

a) Heterosis

b) Self Incompatibility

c) Chromosome markers



Total No. of Questions :8]

SEAT No. :

**P3034**

**[5536]-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, taking at least two question from each section.*
- 2) *Answer to the two sections should be written in SEPARATE answer book.*
- 3) *All question carry equal marks.*
- 4) *Neat diagrams must be drawn WHEREVER necessary*

**SECTION-I**

**Q1)** Discuss comparative account of morphology, anatomy of gametophyte and sporophyte of Psilotales.

- Q2)** a) Give an account of system of Gymnosperms classification as proposed by sporne.
- b) Write on Angiosperms as highly evolved group of plants.

**Q3)** Write short answers of the following:

- a) Comment on apogamy
- b) Explain laboratory and field as tools of taxonomy.

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

- a) Indian Pteridology
- b) Sporophyte of cycadales
- c) Phenetic in taxonomy

**P.T.O.**

## SECTION-II

**Q5)** Discuss the merits and limitations of system of Angiosperm classification as proposed by Takhtajan.

- Q6)** a) Comment on Gymnosperm as prospective ancestor of Angiosperms.  
b) Explain ecads and ecotypes.

**Q7)** Write short answers of the following:

- a) Discuss the classes and subclasses of Magnoliopsida.  
b) Write on principles used in assessing relationship.

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

- a) Role of phytochemistry in taxonomy  
b) Taxonomic hierarchy  
c) Gametophyte of Lycopodiales.





Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P3035**

**[5536]-22**

**M.Sc -I**

**BOTANY**

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

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Answer any five questions, selecting 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 is cell signaling? Describe ethylene activated two component signaling pathway.

**Q2)** a) Explain biogenesis and ultrastructure of Golgi complex.

b) Give principle and working of vis sepectroscopy.

**Q3)** a) Ultrastructure and Functions of E.R.

b) Give an account of sub cellular organization of plant cell and add a note on cytoplasmic matrix.

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

a) Giant chromosomes

b) Cell wall

c) Biogenesis and Functions of ribosomes.

**P.T.O.**

## SECTION - II

**Q5)** a) Principle and working of paper chromatography.

b) Describe structure and Functions of Nucleus.

**Q6)** a) G.M. counting

b) Structure and Functions of Lysosomes.

**Q7)** What is apoptosis? Explain in detail Mitotic cell division.

**Q8)** Write shrot notes on (Any two)

a) Plasmodesmata

b) Plant vacuole

c) Mitochondria



Total No. of Questions : 8]

SEAT No. :

**P3037**

**[5536]-31**

[Total No. of Pages : 2

**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, 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 labelled diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** What is plant development? Explain intrinsic and extrinsic factors affecting plant development. **[16]**

**Q2)** a) Discuss meristem as dynamic centers of cell regeneration. **[8]**

b) Write on gene expression during transition phase : Vegetative to reproductive. **[8]**

**Q3)** Write short answer of following :

a) Comment on oogamy and apogamy. **[8]**

b) Explain molecular genetics of cell incompatibility. **[8]**

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

a) SAM.

b) Parthenogenesis.

c) Apomixis.

**P.T.O.**

## SECTION - II

**Q5)** What is plant tissue culture? Explain nutritional requirements of explant in PTC. [16]

**Q6)** a) Give on account of protoplast culture. [8]

b) Write on stages of micropropagation. [8]

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

a) Comment on production of secondary metabolites.

b) Explain embryo rescue technique.

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

a) Synthetic seeds.

b) Germplasm conservation.

c) Cryopreservation.



Total No. of Questions :8]

SEAT No. :

**P3038**

**[5536]-32**

[Total No. of Pages : 2

**M.Sc. II**

**BOTANY**

**BO-3.2 : Environmental Botany and 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 the separate answer book.*
- 3) *All questions carry equal marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** What is population ecology? Give its characters and add a note on factors affecting natality and mortality.

- Q2)** a) Comment on ecological pyramids. Studied by you.  
b) Give recent approaches in the study of environmental science and add a note on GIS.

**Q3)** Write short answers of the following.

- a) Describe in detail endemism.
- b) What is survivorship curve?

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

- a) Structure of community
- b) Eutrophication
- c) Kyoto protocols.

**P.T.O.**

## SECTION-II

**Q5)** What is EIA? Explain mining study with its scope, process and necessity.

- Q6)** a) What is species diversity? Comment on alpha and beta diversity.  
b) Explain conservation and management. Add a note on CITIES.

**Q7)** Write short answers of the following.

- a) What is value and use of diversity? Comment on its socio-ecological approach.  
b) Comment on marine ecosystem. Add a note on its biotic and abiotic components.

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

- a) Carbon sink  
b) Eutrophication  
c) EMP.



Total No. of Questions :8]

SEAT No. :

**P3039**

**[5536]-34**

[Total No. of Pages :2

**M.Sc.- II**

**BOTANY**

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

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

- 1) *Attempt a total of five questions from the following select atleast two questions from each section.*
- 2) *Answer to the question from each sections should be written in separate answer book.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat labelled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** What are fungi? Give classification of fungi as per Bessey's system. [16]

**Q2)** Answer the followings.

- a) Write briefly on Acrasiomycetes. [8]
- b) Comment on thallus structure in Mastigomycotina. [8]

**Q3)** a) Describe conidiomata types in deuteromycotina. [8]

b) Explain life cycle pattern in Rusts. [8]

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

- a) Plasmodial types
- b) Heterothallism
- c) Fruit bodies in Ascomycotina

**P.T.O.**

## SECTION-II

**Q5)** Discuss various colonization strategies among fungi. **[16]**

**Q6)** Answer the following:

a) Write briefly on rhizosphere fungi. **[8]**

b) Comment on seed borne fungi. **[8]**

**Q7)** a) How fungi act as tools for genetical studies. **[8]**

b) Write on phylloplane fungi. **[8]**

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

a) Fungal growth

b) Fungal sex hormones

c) Carbon nutrition in fungi.





Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P3040**

**[5536]-35**

**M.Sc.- II**

**BOTANY**

**BO.3.33: Angiosperms**

**(2008 Pattern) (Semester -III) (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) *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 the detail account of any two botanical gardens of India. **[16]**

**Q2)** a) Explain the procedure for typification.

b) Explain centrospermae as heterogenous assemblage. **[16]**

**Q3)** a) Comment on Herbarium as multipurpose institute.

b) Give the role of Herbarium in systematics. **[16]**

**Q4)** Write short notes on (any two). **[16]**

a) Amentiferae

b) Digital Herbarium

c) Utility of embryological data in systematics.

**P.T.O.**

## SECTION-II

**Q5)** Comment on angiosperm diversity of western Ghats. **[16]**

**Q6)** Describe the following. **[16]**

- a) Systematics as a synthetic subject.
- b) Comparative account of Biosystematics categories and systematic categories.

**Q7)** Give Objectives and functions of Botanical Garden. **[16]**

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

- a) ICBN Principles
- b) Effective and valid publications
- c) Numerical taxonomy



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P3041**

**[5536]-36**

**M.Sc.-II**

**BOTANY**

**BO-3.34: Plant Physiology-I  
(2008 Pattern) (Semester -III) (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)** Give an account of drought resistance mechanism in plants. **[16]**

**Q2)** a) Discuss the effect of salt stress on plant metabolism. **[8]**

b) Comment on causes of water logging and injury in plants. **[8]**

**Q3)** a) Give an account of transgenics for drought stress tolerance. **[8]**

b) Comment on stress induced proteins. **[8]**

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

a) Abiotic stress

b) Role of proline in water stress.

c) Saline-alkaline soils.

**P.T.O.**

## SECTION-II

**Q5)** What is an ion toxicity? Explain mechanism of tolerance to ion toxicity in plants. [16]

**Q6) a)** Explain the mechanism of UV tolerance in plants. [8]

b) Give the scope and importance of xenobiotic stress study. [8]

**Q7) a)** Give the effects of Al toxicity on plant metabolism. [8]

b) Describe the effects of UV-B radiation on plant metabolism. [8]

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

a) Scavenging of free radicals.

b) Radiation stress

c) Photoinhibition



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P3042**

**[5536]-37**

**M.Sc.-II**

**BOTANY**

**BO-3.35: Genetics, Molecular Biology & Plant Breeding - I  
(2008 Pattern) (Semester -III) (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)** Give the types of polyploids. Describe role of Allopolyploids in evolution of crop plants. **[16]**

**Q2)** a) Enlist types of chromosome banding. Give its applications. **[8]**

b) Comment on chromosome morphology. **[8]**

**Q3)** Explain:

a) Extranuclear inheritance mechanism. **[8]**

b) Site specific recombination method. **[8]**

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

a) YAC

b) Karyotype

c) Chromosome mapping

**P.T.O.**

## SECTION-II

**Q5)** Explain methods of breeding in vegetatively propagated plants. [16]

**Q6) a)** Write on handling of mutagenic treated material in succeeding generations. [8]

b) Comment on pure line selection method for self pollinated crops. [8]

**Q7)** Explain:

a) Factorial experimental design. [8]

b) Technique of hybridization. [8]

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

a) Level of significance

b) Centres of origin of crop plants

c) Chlorophyll mutants



Total No. of Questions :8]

SEAT No. :

**P3043**

**[5536]-38**

[Total No. of Pages :2

**M.Sc. - II**

**BOTANY**

**BO-3.36 : PLANT BIOTECHNOLOGY - I  
(2008 Pattern) (Semester -III) (Special Paper-I)**

*Time : 3 Hours]*

*[Max. Marks : 80*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** Write advantages of plant tissue culture. Explain callus culture method. [16]

**Q2)** Answer the following.

- a) Write on cell suspension culture. [8]
- b) Comment on basic principles of plant tissue culture. [8]

**Q3)** a) Explain role of plant growth regulators in PTC. [8]

- b) Describe somatic embryogenesis. [8]

**Q4)** Write short notes on any two. [16]

- a) Objectives of PTC.
- b) Factors influencing morphogenesis
- c) Stock solutions.

***P.T.O.***

## SECTION-II

**Q5)** Discuss different aspects of Green House Technology. **[16]**

**Q6)** Answer the following.

a) Write importance of cryopreservation. **[8]**

b) Single cell proteins are novel foods. Justify. **[8]**

**Q7)** a) Explain phytoremediation. **[8]**

b) Discuss different types of mycorrhizae. **[8]**

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

a) Methods of cryopreservation

b) BGA

c) Plant derived Vaccines





Total No. of Questions :8]

SEAT No. :

**P3044**

**[5536]-39**

[Total No. of Pages :2

**M.Sc. II**

**BOTANY**

**BO-3.37 Plant Biodiversity-I**

**(2008 Pattern) (Semester -III) (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 is meant by identification of diversity Hotspots. Add a note on endemism and biodiversity. **[16]**

**Q2)** Comment on:

- a) Methods of assessing and measuring biodiversity. **[16]**
- b) The origin of species and species concept

**Q3)** Explain: **[16]**

- a) Allozyme method.
- b) Techniques for monitoring plant biodiversity.

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

- a) Tropical moist forest ecosystems.
- b) Landscape level of biodiversity
- c) Current magnitude in plant diversity

**P.T.O.**

## SECTION-II

**Q5)** Describe Bryophyte and Gymnosperm diversity w.r.t.habit habitat and distribution. **[16]**

**Q6)** Explain- **[16]**

- a) Agroecosystems, urban and periurban diversity.
- b) Origin and evolution of cultivated species diversity.

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

- a) Fungal diversity w.r.t. no. of species and habit habitat distribution and evolutionary success.
- b) Arid and semi arid ecosystems.

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

- a) Distribution of higher plant species diversity
- b) Major ecosystems of the world.
- c) Act of domestication.



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P3045**

**[5536]-40**

**M.Sc. II**

**BOTANY**

**BO.3.38 : Seed Technology**

**(2008 Pattern) (Semester -III) (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 labelled diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Give an account of development and structure of female gametophyte. [16]

**Q2)** a) Discuss physiological and biochemical changes during seed germination. [8]

b) Define seed dormancy and describe types of it. [8]

**Q3)** a) Comment on entry points and mechanism of seed transmission, [8]

b) Explain factors affecting seed germination. [8]

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

a) Seed industries in India.

b) Seed vigour

c) Concept of seed technology.

**P.T.O.**

## SECTION-II

**Q5)** Give an account of life cycle pattern of pulses pest. Add a note on its control measure. **[16]**

**Q6) a)** Discuss constructional features for good seed warehouse. **[8]**

b) Explain causes of seed deterioration. **[8]**

**Q7) a)** Comment on storage grain pest. **[8]**

b) Discuss impact of seed infection on seed and planting value. **[8]**

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

a) Mechanism of seed transmission

b) Seed storage

c) Scope of seed pathology



Total No. of Questions : 8]

SEAT No. :

**P3047**

[Total No. of Pages : 2

[5536]-42

M.Sc. - II

**BOTANY**

**BO - 4.2 : Applied Botany**

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

*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 labelled diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** What is BGA? Describe in detail the mass production technology of Spirulina. Add a note on its nutritive value.

**Q2)** a) Explain the role of fungi in Alcohol, brewing and wine industry.  
b) What are measures of central tendency? Explain Median with suitable example.

**Q3)** a) Explain how fungi are used in particulate absorption and biosorption.  
b) Explain the production of Ergot alkaloid. Add a note on its applications.

**Q4)** Write explanatory notes on ANY TWO of the following.

- a) Fungi as Mycofungicides
- b) Sea weeds and its applications
- c) Role of white rot fungi in bioremediation

**P.T.O.**

## SECTION - II

- Q5)** a) Give an account of submerged and shallow fermentation technology.  
b) Fungi as antitumor and antiviral agents.

**Q6)** What is  $\chi^2$  - test? Explain the procedure with suitable example and add a note on its applications.

- Q7)** a) Web based tools for sequence searches.  
a) Role of fungi as human pathogens.

**Q8)** Write notes on ANY TWO.

- a) Correlation  
b) Fungi in allergy  
c) Fungal Fermented food

