

Total No. of Questions : 8]

SEAT No. :

**P1282**

**[5436]-101**

[Total No. of Pages : 2

**M.Sc.-I**

**BOTANY**

**BO-1.1 : Cryptogamic Botany (Part-I)  
(2013 Pattern) (Credit System) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

**Q1) a)** Write the affinities of Bryophytes with thallophytes [4]

b) Give the economic importance of Pteridophytes [4]

c) Write the differences between apogamy and apospory. [2]

**Q2) a)** Discuss Telome theory [4]

b) Give classification of Bryophytes as per G.M. Smith [4]

c) Write a note on Calobryales [2]

**Q3) a)** Explain vegetative reproduction in Bryophytes. [4]

b) Comment on Lepidostrobos and Lepidocarpon [4]

c) Give a brief account on gametophyte of Psilotum [2]

**Q4) a)** Comment on stellar evolution. [4]

b) Explain the evolution of sporophytes in Bryophytes. [4]

c) Give a brief account of fossil Bryophytes. [2]

**Q5) a)** Comment on the morphology of sporophyte and gametophyte of isoetales. [5]

b) Write a note on sporophyte of polytrichales [5]

**P.T.O.**

- Q6)** a) Give a detail account of Takakiales and Monocleales [5]  
b) Describe the sporophyte of Salvinia [5]
- Q7)** a) Comment on the sporophyte of osmundales and Marattiales [5]  
b) Mention the important characters of Lycopsida and add a note on Life cycle pattern in Selaginella [5]
- Q8)** a) Discuss the types of Sporophytes and gametophytes in Marchantiales [5]  
b) Comment on the characters of calamites and Annularia [5]

✓ ✓ ✓

Total No. of Questions :8]

SEAT No. :

**P1283**

[Total No. of Pages :2

**[5436] - 102**

**M.Sc. - I**

**BOTANY**

**BO - 1.2 : Plant Physiology and Biochemistry**

**(2013 Pattern) (Semester - I) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagram wherever necessary.*

- Q1)** a) Comment on phloem loading and unloading. [4]  
b) Explain the mechanism of resistance to biotic stresses. [4]  
c) Write on enzyme kinetics. [2]
- Q2)** a) Discuss biosynthesis of glycolipids. [4]  
b) Explain biosynthesis of gibbereling. [4]  
c) What is biological clock. [2]
- Q3)** a) Give secondary structure of proteins. [4]  
b) Write on working application of leaf area meter. [4]  
c) What are flavonoids. [2]
- Q4)** a) Describe CAM pathway. [4]  
b) Write on enzyme inhibition. [4]  
c) What are nucleic acid. [2]

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

- Q5)** a) Explain ETS. [5]  
b) Comment on biosynthesis of cytokinins. [5]
- Q6)** a) Write on cyanide resistance pathway. [5]  
b) Discuss synthesis of carbohydrate. [5]
- Q7)** a) State metabolic changes that occur during fruit ripening. [5]  
b) Explain the mechanism of root nodulation of symbiotic nitrogen fixation. [5]
- Q8)** a) Comment on alkaloid biosynthesis pathway. [5]  
b) Explain gluconeogenesis. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1284**

**[5436]-103**

**M.Sc. - I**

**BOTANY**

**BO - 1.3 : Genetics and Plant Breeding  
(2013 Pattern) (Credit System) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat and labelled diagrams wherever necessary.*

- Q1)** a) Explain “Mendel’s Law’ of Independent assortment with suitable example. [4]
- b) What is recombination? Describe homologous and non homologous recombination. [4]
- c) Write on point mutation. [2]
- Q2)** a) Explain lytic cycle in phages. [4]
- b) State principles of combination breeding and give its applications. [4]
- c) What is monosomic aneuploids. [2]
- Q3)** a) Explain chloroplast gene inheritance mechanism in Zea mays. [4]
- b) Describe unordered tetrad analysis in yeast. [4]
- c) What is multiple alleles? [2]
- Q4)** a) Comment on “BA translocation. [4]
- b) What is chromosomal banding? Explain different types of banding. [4]
- c) What are quantitative traits? [2]

**P.T.O.**

- Q5)** a) Explain physical and chemical mutagens for induction of mutation. [5]  
b) Write on structural alternations of chromosomes. [5]
- Q6)** a) Explain quantitative inheritance in Nicotiana corolla length. [5]  
b) Give cytological and genetical methods of identification of allopolyploids. [5]
- Q7)** a) Discuss interreaction between nuclear and cytoplasmic inheritance. [5]  
b) Describe selection method in cross pollinated crops. [5]
- Q8)** a) What is karyotype? Give the method of preparation of Karyotype. [5]  
b) Comment on 'Marker assisted selection'. [5]



Total No. of Questions : 8]

SEAT No. :

**P1285**

**[5436]-104**

[Total No. of Pages : 2

**M.Sc. - I**

**BOTANY**

**BO - 1.4 : Botanical Techniques  
(2013 Pattern) (Credit System) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat diagrams must be drawn wherever necessary.*

- Q1)** a) Explain different immunoelectrophoretic techniques. [4]  
b) Give principle of NMR spectroscopy. Write its applications. [4]  
c) What is ampholyte? Write its use in isoelectric focussing. [2]
- Q2)** a) Write on maceration, squash & peeling techniques. [4]  
b) Discuss principle & working of oxygen electrode. [4]  
c) State Beer-Lambert law. [2]
- Q3)** a) Explain gel filtration technique. [4]  
b) Write principle & applications of fluorescence microscopy. [4]  
c) Differentiate between “Antigen” & “Antibody”. [2]
- Q4)** a) Describe any one electrophoretic technique. Mention its applications. [4]  
b) Comment on principle & applications of spectroflurimetry. [4]  
c) Write on two types of micrometers. Write their use. [2]

*P.T.O.*

- Q5)** a) What is microtomy? Describe the different types of microtome. [5]  
b) Give an account of agarose & polyacrylamide media used in electrophoresis. [5]
- Q6)** a) Write a note on radioactivity & its uses in techniques. [5]  
b) Discuss the method for sequencing of proteins. [5]
- Q7)** a) Illustrate the components of mass spectrometer. [5]  
b) Write a note on Light microscopy w.r.t. principle, instrumentation & applications. [5]
- Q8)** a) Give comparative account of paper & thin layer chromatography. [5]  
b) Explain the technique of PCR. Enlist its applications. [5]





Total No. of Questions : 8]

SEAT No. :

**P1286**

**[5436]-201**

[Total No. of Pages : 2

**M.Sc. - I**

**BOTANY**

**BO -2.1 : Cryptogamic Botany (Part - II)  
(2013 Pattern) (Semester - II) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat and well labelled diagrams wherever necessary.*

- Q1)** a) Give the outline of classification of algae upto order level as proposed by Fritsch. [4]  
b) Comment on pigment constitution in algae. [4]  
c) What is biochemical systematics? [2]
- Q2)** a) Give distinguishing characters and thallus structure in chroococcales. [4]  
b) Write on algal habitat. [4]  
c) Explain anatomy of lichen thallus. [2]
- Q3)** a) Discuss sexual reproduction in chlorophyta. [4]  
b) Describe structure of thallus and reproductive bodies in Myxomycotina. [4]  
c) Write note on evolution of sexuality in Ascomycotina. [2]
- Q4)** a) Write on thallus structure and reproduction in charophyta. [4]  
b) Comment on nutrition and cell structure of fungi. [4]  
c) What are mycorrhizae? [2]

*P.T.O.*

- Q5)** a) Give distinguishing characters, thallus structure and reproduction in chrysophyta. [5]  
b) Comment on recent studies of fungi in abroad and in India. [5]
- Q6)** a) Explain life cycle pattern in Rhodophyta. [5]  
b) Give an account of Oomycetes fungi. [5]
- Q7)** a) Discuss the life cycle pattern in zygomycotina. [5]  
b) Write on fruit bodies in Gasteromycetes. [5]
- Q8)** a) What are imperfect fungi? comment on fructifications in denteromycotina. [5]  
b) Comment on mycotoxins. [5]



Total No. of Questions : 8]

SEAT No. :

**P1287**

[Total No. of Pages : 2

**[5436]-202**

**M. Sc. - I**

**BOTANY**

**BO - 2.2 : Cell Biology and Evolution**

**(2013 Pattern) (Credit System) (Theory) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*
- 4) *Figures to the right indicate full marks.*

- Q1)** a) Give ultrastructure and functions of cell wall. [4]  
b) Write a role of ER in synthesis and transport. [4]  
c) What is Hardy-weinberg Law? [2]

- Q2)** a) Explain oparin & Halden concept. [4]  
b) Give the ultrastructure and function of Lysosomes. [4]  
c) Enlist different components of cytoskeleton. [2]

- Q3)** a) What is Apoptosis? Explain genetic control of apoptosis. [4]  
b) Explain molecular events occurring during cell cycle. [4]  
c) Define gene pool. [2]

- Q4)** a) Explain stomatal guard signaling. [4]  
b) Describe the structure and role of plasmodesmata. [4]  
c) What is allopatric speciation. [2]

- Q5)** a) Explain ultrastructure of Golgi complex. [5]  
b) Give an account of methods to study cell cycle. [5]

**P.T.O.**

- Q6)** a) Explain the concept of molecular clock. [5]  
b) Give an account of theory of natural selection. [5]
- Q7)** a) Write a note on molecular aspects of cell death. [5]  
b) Give an account of evolution of unicellular eukaryotes. [5]
- Q8)** a) Explain the role of different factors affecting gene frequencies. [5]  
b) Explain Nuclear-Organelle signaling during plastid development. [5]



Total No. of Questions :8]

SEAT No. :

**P1288**

**[5436]-203**

[Total No. of Pages : 2

**M.Sc. -I**

**BOTANY**

**BO-2.3: Molecular Biology & Genetic Engineering  
(2013 Pattern) (Semester-II) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labeled diagram must be drawn wherever necessary.*

- Q1)** a) Explain the mechanism of eukaryotic DNA replication. [4]  
b) Write dissociation & reassociation kinetics of DNA. [4]  
c) Enlist types of DNA damage. [2]
- Q2)** a) Give mechanism of Transcription in eukaryotes. [4]  
b) Comment on Lac operon. [4]  
c) Write on introns. [2]
- Q3)** a) Explain the role of BACs & YACs in gene cloning. [4]  
b) What is c-DNA library? Give the steps for preparation of c-DNA library. [4]  
c) Write factors affecting transformations. [2]
- Q4)** a) Describe spectroscopic and thermal properties of nucleic acids. [4]  
b) Enlist enzymes involved in DNA repair. [4]  
c) What is chaperon. [2]

*P.T.O.*

- Q5)** a) Describe mechanism of protein synthesis in eukaryotes. [5]  
b) Explain the mechanism of positive & negative regulation of prokaryotes. [5]
- Q6)** a) Give an account on the applications of genetic engineering for abiotic stress tolerance. [5]  
b) Describe direct gene transfer methods in plants. [5]
- Q7)** a) Comment on forms of DNA. [5]  
b) Explain recombination & mismatch repair systems. [5]
- Q8)** a) Comment on construction of recombinant molecule. [5]  
b) Discuss RNA processing during transcription. [5]



Total No. of Questions : 8]

SEAT No. :

**P1289**

**[5436] - 204**

[Total No. of Pages : 1

**M.Sc. - I**

**BOTANY**

**BO - 2.4 : Plant Ecology and Phytogeography  
(2013 Pattern) (Semester - II) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labeled diagrams wherever necessary.*

- Q1)** a) State the impact of environmental pollution with respect to water. [4]  
b) What are extinction events ? [4]  
c) What is ecotone ? [2]
- Q2)** a) Comment on water holding capacity of soil. [4]  
b) Explain fresh water ecosystem. [4]  
c) What is ecosystem. [2]
- Q3)** a) What is acid rain ? Explain its impact on vegetation . [4]  
b) Describe concept of metapopulation [4]  
c) Comment on r and k selection. [2]
- Q4)** a) Describe Autogenic and allogenic plant succession. [4]  
b) Give plant distribution with respect to climatic factors. [4]  
c) What is Endemism ? [2]
- Q5)** a) Comment on life history strategies. [5]  
b) Explain terrestrial ecology. [5]
- Q6)** a) Comment on major plant communities of world. [5]  
b) Write a note on population size. [5]
- Q7)** a) Explain Xerosere. [5]  
b) Give components of Biomes. [5]
- Q8)** a) Write a note on soil microbes. [5]  
b) Write an account of "Energy flow". [5]



Total No. of Questions : 8]

SEAT No. :

**P1290**

**[5436]-301**

[Total No. of Pages : 2

**M.Sc. -II**

**BOTANY**

**BO-3.1 : Spermatophytic Botany  
(2013 Pattern) (Semester-III) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw neat and well labelled diagrams wherever necessary.*

- Q1)** a) Give general characters of Cycadeoidales. [4]  
b) Comment on morphology of Ginkgoales. [4]  
c) Write on Cladistics in taxonomy. [2]
- Q2)** a) Write systematic position of Najadaceae [4]  
b) Comment on classification of spermatophyta as per sporne. [4]  
c) Give general characters of Ginkgoales. [2]
- Q3)** a) Write on Pre-Darwinian systems of classification of angiosperms. [4]  
b) Give phylogeny of Lauraceae. [4]  
c) Comment on Medullosa. [2]
- Q4)** a) Give general characters and affinities of Ephedrales. [4]  
b) Give an outline of Dahlgren and thorne system of classification. [4]  
c) What is invasions and introductions. [2]
- Q5)** a) Describe general characters of cordaitales. [5]  
b) Explain rules and recommendations of ICBN. [5]

*P.T.O.*



- Q6)** a) Comment on Sporophytes and gametophytes of welwitschiales [5]  
b) Write inter-relationships and economic importance of magnoliaceae. [5]
- Q7)** a) Give characters and structure of Lyginopteris. [5]  
b) Comment on pre-Darwinian system of classification of angiosperms [5]
- Q8)** a) Give general characters of Cycadales [5]  
b) Describe hotspots and hottest spots. [5]

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Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

**P1291**

**[5436] - 302**

**M.Sc. - II**

**BOTANY**

**BO-3.2 : Developmental and Economic Botany**

**(2013 Pattern) (Semester - III) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagram must be drawn wherever necessary.*

- Q1)** a) Explain intrinsic factors affecting plant development. [4]  
b) Give an account of fertilization. [2]  
c) Explain the term specification. [4]
- Q2)** a) Discuss on light mediated development. [4]  
b) Give source method of cultivation of sorghum. [4]  
c) What is differentiation? [2]
- Q3)** a) Give an account of seed germination. [4]  
b) Comment on development of mole gametophyte. [2]  
c) Give difference between phototropism and geotropism. [4]
- Q4)** a) Explain positional information techniques. [4]  
b) State source and economical importance of red sandalwood and clove oil. [4]  
c) What is bioassay. [2]

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

- Q5)** a) Discuss meristems as dynamic centers for cell regeneration. [5]  
b) What is polyembryony? Give classification of polyembryony. [5]
- Q6)** a) What is organ culture? Explain its role in understanding plant development. [5]  
b) Comment on sugar industry and its byproducts. [5]
- Q7)** a) Explain cell-cell interactions during plant development. [5]  
b) Discuss on gene expressions during transition to flowering. [5]
- Q8)** a) Give an account of abnormal embryos. [5]  
b) Comment on tea and coffee industry. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1292**

**[5436]-303**

**M.Sc.**

**BOTANY**

**BO - 3.3 : Industrial Botany - I**

**(2013 Pattern) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat and labelled diagrams wherever necessary.*

- Q1)** a) Comment on penicillin production method. [4]  
b) Discuss Azadiractine as a biopesticide. [4]  
c) Mention the alternatives for fossil fuel. [2]
- Q2)** a) Give the difference between management and administration. [4]  
b) Describe the process of extraction of biodiesel from microalgae . [4]  
c) Enlist the microbes used for Antibiotic production. [2]
- Q3)** a) Discuss mass multiplication process of Trichoderma. [4]  
b) Explain citric acid production method. [4]  
c) What is SIDCO? [2]
- Q4)** a) Describe the method of bioethanol production from starch. [4]  
b) List the institutes which provide support to entrepreneurs. Comment on any one of them. [4]  
c) Give the significance of herbal biopesticides. [2]

**P.T.O.**

- Q5)** a) Comment on concept & characteristics of business. [5]  
b) Give the applications of seaweed biofertilizers. [5]
- Q6)** a) Comment on technology applications of bioethanol. [5]  
b) Write on use of computer in fermenters. [5]
- Q7)** a) Give the need and objectives of accounting. [5]  
b) Comment on distribution of economically important algae in India. [5]
- Q8)** a) Comment on economy of Lipid biofuels. [5]  
b) Give the different types of fermentation process. Add a note on continuous fermentation. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1293**

**[5436]-304**

**M.Sc. - II**

**BOTANY**

**BO - 3.41 : Advanced Mycology and Plant Pathology  
(2013 Pattern) (Special) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

- Q1)** a) Write Hawker's system of fungi classification. [4]  
b) Comment on Protosteliomycetes. [4]  
c) Mention contributions of Anton De Bary. [2]
- Q2)** a) Give an account of sexual spores in fungi with examples. [4]  
b) Discuss molecular methods of fungal taxonomy. [4]  
c) Briefly write on Labyrinthulomycota. [2]
- Q3)** a) Explain relations of fungi with plants and animals. [4]  
b) Describe Loculoascomycetes. [4]  
c) How fungi act as microbiological sensors. [2]
- Q4)** a) What are Oomycota? [4]  
b) Comment on plasmodiophoranyota. [4]  
c) Enlist any four beneficial aspects of fungi. [2]

*P.T.O.*

- Q5)** a) Write ecological groups of fungi. [5]  
b) Discuss Auriculariales and Dacrymycetales. [5]
- Q6)** a) Explain different aspects of mycorrhizae. [5]  
b) Give an account of conidiomata. [5]
- Q7)** a) Describe combative and ruderal strategies in fungi with examples. [5]  
b) What are uredinales? Add a note on life cycle of rusts. [5]
- Q8)** a) Mention characters of Zygomycetes and add a note on Entomophthorales. [5]  
b) Comment on systemic mycotic infections in humans. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1294**

**[5436]-305**

**M.Sc. - II**

**BOTANY**

**BO - 3.42 : Advanced Angiosperms  
(2013 Pattern) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

- Q1)** a) Justify Pollen characters are taxonomically important. [4]  
b) Comment on Taxometrics. [4]  
c) Write briefly on SEM and its significance in taxonomy. [2]
- Q2)** a) Explain use of aminoacids sequence in systematics. [4]  
b) Comment on genetic variation in plant systematics. [4]  
c) Write on OUTs. [2]
- Q3)** a) Discuss systematics position of Dilleniaceae. [4]  
b) Comment on ecological variations in systematics. [4]  
c) What is Polynogram? [2]
- Q4)** a) Describe different stages in chemotaxonomic investigations. [4]  
b) Comment on RAPD relation to taxonomy. [4]  
c) Give economic importance of Fracaceae. [2]

*P.T.O.*



- Q5)** a) Discuss the angiosperms with reference to Wood anatomy. [5]  
b) Explain phenetic methods in taxonomy. [5]
- Q6)** a) Discuss systematic position of Family Pandanaceae. [5]  
b) Give silent features of Family Bignoniaceau. Describe Floral variation in it. [5]
- Q7)** a) What is ploidy? Explain the role of an euploidy in systematics. [5]  
b) Comment on meiotic analysis in plant systematics. [5]
- Q8)** a) Explain the role of RFLP technique in plant systematics. [5]  
b) Give phylogeny and economic importance of Costaceae. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1295**

**[5436]-306**

**M.Sc. - II**

**BOTANY**

**BO - 3.43 : Advanced Plant Physiology  
(2013 Pattern) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

- Q1)** a) Explain role of microbes in availability of nutrients. [4]  
b) Write on physiology of seed maturation. [4]  
c) What is role of ATPase as transporter? [2]
- Q2)** a) Discuss role of growth regulator in plant growth. [4]  
b) Give significance of cyanide resistance pathway. [4]  
c) Enlist different secondary metabolites in plants. [2]
- Q3)** a) Comment on vegetative growth in plants. [4]  
b) What is photoperiodism? Add a note on SDP with its examples. [4]  
c) Mention the role played by ethelene in fruit ripening. [2]
- Q4)** a) Give an account of strategies developed by plants for conservation of water. [4]  
b) Explain the various factors breaking seed dormancy. [4]  
c) Write the mechanism of active uptake of minerals. [2]

*P.T.O.*

- Q5)** a) Give an account of evolution of PE Pase. [5]  
b) Comment on action of mechanism in plant for abiotic stress defence. [5]
- Q6)** a) Give the comparative account of photosynthetic ETS in pro and eukaryotic organisms. [5]  
b) Describe CAM pathway in aquatic plants. [5]
- Q7)** a) Write the role of respiration in plant carbon balance. [5]  
b) Explain post harvest physiology of fruits. [5]
- Q8)** a) Discuss relative growth rate and net assimilation rate. [5]  
b) Comment on metabolism and allocation of resource during reproductive growth. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1296**

**[5436]-307**

**M.Sc. - II**

**BOTANY**

**BO - 3.44 : Advanced Genetics and Molecular Biology  
(2013 Pattern) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagrams wherever necessary.*

**Q1)** a) Explain the structure of prokaryotic chromosome. [4]

b) Give general characteristic and mechanism of transposition. [4]

c) Comment of Lampbrush chromosome. [2]

**Q2)** a) Explain the mechanism of prokaryotic DNA replication. [4]

b) Describe genetic organisation of T<sub>4</sub> bacteriophage. [4]

c) Write on single burst experiment. [2]

**Q3)** a) Describe satellite chromosome. [4]

b) Explain the mutations observed in T<sub>4</sub> genome. [4]

c) Write a concept of restriction mapping. [2]

**Q4)** a) Comment on DNA typing and population structure. [4]

b) Describe the Hardy-Weinberg principle & applications. [4]

c) Write on enzyme polymorphism. [2]

**Q5)** a) Comment on premature lysis experiment. [5]

b) Explain gene expression and regulatory sequences. [5]

*P.T.O.*

- Q6)** a) Write on conjugal and functions in plasmid. [5]  
b) Discuss automated DNA sequencing methods. [5]
- Q7)** a) Write on microsattelites. [5]  
b) Comment on allele frequencies in genotype and their calculations. [5]
- Q8)** a) Describe various experimental method used to study phase infection.[5]  
b) Give an account of Wheat gluten protein. [5]



Total No. of Questions : 8]

SEAT No. :

**P1297**

**[5436]-308**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO - 3.45 : Advanced Plant Biotechnology  
(2013 Pattern) (Credit System) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

- Q1)** a) State characteristics of ideal vectors? Explain the importance of lamda ( $\lambda$ ) phage vector in gene cloning. [4]
- b) Explain DNA microarray technique. [4]
- c) What are natural secondary metabolites produced from plant? [2]
- Q2)** a) Give an account of virus resistance induced in plant by using coat protein mediated nucleocapsid gene. [4]
- b) Explain different types of culture system used for production of Secondary metabolites. [4]
- c) What are DNA probe? [2]
- Q3)** a) Describe the working of PCR. [4]
- b) Write note on TILLING. [4]
- c) What is cosmid vectors? [2]
- Q4)** a) Explain biotechnological strategies to prevent post-harvest losses of flowers with suitable examples. [4]
- b) Enlist and explain role of elicitors used in Secondary metabolite production. [4]
- c) State applications of PCR. [2]

*P.T.O.*

- Q5)** a) Describe sanger and Gilbert method of DNA sequencing. [5]  
b) Comment on “Differential display of mRNA technique”. [5]
- Q6)** a) Justify “Post-harvest losses are prevented by transgenic plants in fruits”. [5]  
b) Describe method of screening and selection of high Secondary metabolite producing cell lines. [5]
- Q7)** a) Describe Northern hybridization techniques and enlist its applications. [5]  
b) Comment on SAGE technique. [5]
- Q8)** a) State strategies to develop abiotic stress tolerance plant. [5]  
b) Justify “Immobilization of cells for improving secondary metabolite production. [5]



Total No. of Questions : 8]

SEAT No. :

**P1298**

**[5436]-309**

[Total No. of Pages : 2

**M.Sc.**

**BOTANY**

**BO - 3.46 : Advanced Medicinal Botany  
(2013 Pattern) (Credit System) (New) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*

- Q1)** a) Discuss cultivation and utilization of Aromatic plants in India. [4]  
b) Give detailed account of Eucalyptus and Isabgol w.r.t. source, cultivation and collection of drug. [4]  
c) What is immunomodulatory medicinal plant? [2]
- Q2)** a) Comment on biosynthesis of glycosides. [4]  
b) Write a note on Biogenesis of phytopharmaceuticals. [4]  
c) Enlist the traditional and alternative system of medicine. [2]
- Q3)** a) Discuss Ayurvedic profile of Bhringraj. [4]  
b) Comment on Biological and Chemical method of evaluation. [4]  
c) Write application of Amla. [2]
- Q4)** a) Give detailed account of liquorice and Shatavari w.r.t source, cultivation and collection. [4]  
b) Comment on pharmacological classification of crude drug. [4]  
c) What is crude drug? [2]

*P.T.O.*



- Q5)** a) Enumerate applications of Ashwagandha and Vasaka. [5]  
b) Write on Ayurvedic profile of Gulvel and Hirda. [5]
- Q6)** a) Explain the phenomenon of quality control of herbal drugs. [5]  
b) Explain pharmacognostic studies w.r.t. source, cultivation, collection, macroscopic characters and applications of Sandal Wood. [5]
- Q7)** a) Discuss method of cultivation and factors affecting cultivation of medicinal plants. [5]  
b) Write on Analytical pharmacognosy w.r.t. drug adulteration. [5]
- Q8)** a) Discuss history, definition and scope of pharmacognosy. [5]  
b) Comment on industrial aspects of pharmacognosy w.r.t. Neutraceuticals and Cosmeceuticals. [5]



Total No. of Questions : 8]

SEAT No. :

**P1299**

**[5436]- 311**

[Total No. of Pages : 2

**M.Sc.**

**BOTANY**

**BO - 3.48 : Advanced Seed Technology ( Special)  
(2013 Pattern) (Semester - III) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*

- Q1)** a) Give characteristics of quality seeds. [4]  
b) Describe structure of male gametophyte. [4]  
c) What is genetic purity ? [2]
- Q2)** a) Explain methods of breaking of seed dormancy. [4]  
b) Discuss causes of seed deterioration. [4]  
c) What is seed dormancy ? [2]
- Q3)** a) Comment on seed village concept. [4]  
b) Write note on quarantine for seed. [4]  
c) What is  $T_2$  test. [2]
- Q4)** a) Describe role of self incompatibility and gametocides in hybrid seed production. [4]  
b) Give general layout of seed processing plant. [4]  
c) What is allogamy ? [2]
- Q5)** a) Write note on DNA finger printing. [5]  
b) Explain general principals of seed storage. [5]

**P.T.O.**

- Q6)** a) Comment on pests of pulses [5]  
b) Give significance of seed transmission. [5]
- Q7)** a) Discuss central seed committee and its function. [5]  
b) Write note on air screen cleaner. [5]
- Q8)** a) Describe grow dat test. [5]  
b) Give construction and working of seed dryes. [5]



Total No. of Questions : 8]

SEAT No. :

**P1300**

**[5436]- 312**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO - 3.50 : Advanced Biodiversity  
(2013 Pattern) (Semester - III) (Credit System) (Special)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*

- Q1)** a) Describe algal and pteridophyte diversity w. r. t. species, habit, habitat and distribution at taxonomic level. [4]  
b) Explain RAPD . [4]  
c) Comment on nature and origin of genetic variations. [2]
- Q2)** a) Describe the angiosperm diversity at taxonomic level w.r.t species, habit, habitat and distribution. [4]  
b) Write on alpha and beta diversity. [4]  
c) Give an account of fresh water ecosystem. [2]
- Q3)** a) Explain endemism and biodiversity with examples. [4]  
b) Comment on diversity indices based on species richness. [4]  
c) Write about inbreeding depression. [2]
- Q4)** a) Discuss the role of farm and home garden conservation. [4]  
b) Explain role of educational institutes in biodiversity conservation [4]  
c) Comment on Species richness. [2]
- Q5)** a) Explain population as a critical factor in species extinction. [5]  
b) Discuss factors affecting genetic diversity. [5]

*P.T.O.*

- Q6)** a) Give an overview of variety of life forms. [5]  
b) Comment on Biodiversity of India [5]
- Q7)** a) Discuss IUCN threatened categories. [5]  
b) Write a note on metapopulation concept [5]
- Q8)** a) Explain role of biotechnology in conservation and utilization of biodiversity. [5]  
b) Comment on aesthetic values of biodiversity and its use as fodder. [5]



Total No. of Questions : 8]

SEAT No. :

**P1301**

**[5436]-401**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO - 4.1 : COMPUTATIONAL BOTANY  
(2013 Pattern) (Semester - IV) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagram whenever necessary.*

**Q1) a)** Calculate mean median and mean deviation from following data  
30, 45 ,70, 20, 60, 50, 10,..... [4]

b) From following data draw scattered diagram and write your conclusion. [4]

Dose of	10	14	18	22	26	30	34	38	42	46	50
fertilizer											

Yield	1.78	1.66	1.62	1.59	1.55	1.60	1.58	1.54	1.50	1.48	0.43
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c) What is variance? [2]

**Q2) a)** Comment on BLAST and FASTA. [4]

b) What are database? state few example of database. [4]

c) What is phylogenetic relationship? [2]

**Q3) a)** How many milliliter of 519 H<sub>2</sub>SO<sub>4</sub> are required to make 1500ml of a  
0.00219 H<sub>2</sub>SO<sub>4</sub> sol<sup>n</sup>? [4]

b) Explain the concept of "Equilibrium constant". [4]

c) What is standard error? [2]

**Q4) a)** Give fishers basic principles for good experiment design. [4]

b) Explain Tukey's test for pairwise comparison of treatment. [4]

c) What is specific activity of radioisotopes. [2]

**P.T.O.**

**Q5) a)** Calculate value of chi-square from the following data. [5]

	$x_1$	$x_2$	$x_3$
$y_1$	7	8	5
$y_2$	8	9	6
$y_3$	9	7	8

b) Calculate pearson's coefficient correlation cultivation cost and profit of cotton. [5]

Cultivation 390 650 620 900 820 750 250 980 360 780

Cost per acre

Profit (Rs.)

Thousands 47 53 58 86 62 68 60 91 51 84

**Q6) a)** Explain mann whitney U test Give its significance. [5]

b) Discuss the submission tool in gene bank. [5]

**Q7) a)** Describe the procedure of making radio isotope Sol<sup>n</sup>. [5]

b) Explain the determination of phylogenetic relationship using DNA and protein sequence. [5]

**Q8) a)** Explain osmolarity and osmotic pressure. [5]

b) State the properties of mean, median and mode. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

**P1302**

**[5436]-402**

**M. Sc. - II**

**BOTANY**

**BO - 4.2 : Plant Organism Interaction  
(2013 Pattern) (Credit System) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagram must be drawn wherever necessary.*

- Q1)** a) Explain concept of allelopathy. [4]  
b) Write on algal-fungal association. [4]  
c) What is mycorrhizae? [2]
- Q2)** a) Describe competitive mechanisms in plants. [4]  
b) Comment on fungal-insect interactions. [4]  
c) Enlist any four epiphytic plants. [2]
- Q3)** a) Comment on fruit dispersal mechanism. [4]  
b) Write on any two carnivorous plants. [4]  
c) What is thermogenesis? [2]
- Q4)** a) How beetles and bees act as pollinators? [4]  
b) Write on any mechanisms of mimicry. [4]  
c) How birds act as pollinators? [2]

**P.T.O.**



- Q5)** a) Comment on endophytes. [5]  
b) Explain algal-coral relationship. [5]
- Q6)** a) Write on nodulating bacteria. [5]  
b) Discuss parasitic plant association. [5]
- Q7)** a) How flowers have modified for cross pollination? [5]  
b) Give brief account of herbivore-insect plant interactions. [5]
- Q8)** a) Write on plant signalling and defense against herbivores. [5]  
b) Explain co evolution of fig-figwast interactions. [5]



Total No. of Questions :8]

SEAT No. :

**P1303**

**[5436]-403**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO- 4.3: Industrial Botany-II**

**(2013 Pattern) (Semester-IV) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat & labelled diagrams wherever necessary.*

**Q1) a)** Give an account of international trade in tropical & subtropical fruits.[4]

b) Explain an aromatic plants as source of essence. [4]

c) What is landscape gardening? [2]

**Q2) a)** Write on design, maintenance & sterilization practices in PTC laboratory.[4]

b) Comment on natural dyes used in cotton & silk industries. [4]

c) Give the contributions of fruits to GDP in India. [2]

**Q3) a)** Give biotechnology approaches for improvement of quality & post harvest life of fruits. [4]

b) Describe the method of cultivation of Orchids. [4]

c) What is surface sterilization? [2]

**Q4) a)** Prepare a bankable techno commercial report of micropropagation of Banana. [4]

b) Give the scope & role of floriculture in developing countries. [4]

c) What is phyto-technology? [2]

*P.T.O.*

- Q5)** a) Discuss the value addition to biodiversity through chemoprospection.[5]  
b) Prepare a landscape design for factories. [5]
- Q6)** a) Give market potential & tissue culture raised plantlets of Banana & Sugarcane. [5]  
b) Give an account of styles of gardening. [5]
- Q7)** a) Write the protocol for preparation & surface sterilization of explant.[5]  
b) Explain process of manufacturing of jam & jellies. [5]
- Q8)** a) Comment on environmental factors affecting fruit deterioration. [5]  
b) Discuss medicinal mushroom for healthy life. [5]



Total No. of Questions : 8]

SEAT No. :

**P1304**

**[5436] - 404**

[Total No. of Pages : 2

**M.Sc. - II**

**BOTANY**

**BO - 4.4 : Plant Pathology**

**(2013 Pattern) (Semester - IV) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Neat labelled diagrams must be drawn wherever necessary.*

- Q1)** a) Give an account of penetration of microorganisms in host through stomata. [4]  
b) What is the effect of soil pH and texture on the disease development ? [4]  
c) Write the names of any two viral diseases and their causal organisms. [2]
- Q2)** a) Explain the use of breeding methods for improving the resistance of the plants. [4]  
b) Comment on forecasting of plant disease epidemics. [4]  
c) What are biotrophs ? Give two examples. [2]
- Q3)** a) Explain the concept of vertical resistance in plants. [4]  
b) What are the diagnostic methods for detecting pathogens ? [4]  
c) State antigen hypothesis. [2]
- Q4)** a) What is the effect of pathogen on translocation of water in host ? [4]  
b) What are the different causes of plant diseases ? [4]  
c) What are chemical activators of resistance ? Give two examples. [2]
- Q5)** a) Give an account of bacterial diseases of plants . [5]  
b) Describe Non - host specific toxins with two examples. [5]

**P.T.O.**

- Q6)** a) Write on the symptoms developed in plant diseases. [5]  
b) Comment on the post harvest diseases of fruits with examples. [5]
- Q7)** a) Explain the process of pectin degradation of host by pathogen. [5]  
b) How is plant disease assessment done ? [5]
- Q8)** a) Comment on induced biochemical defense in plants. [5]  
b) What is the role of biotechnology in plant pathology ? [5]

