

Total No. of Questions : 8]

SEAT No. :

P3055

[5536]-101

[Total No. of Pages : 2

M.Sc.

BOTANY

**BO-1.1 : Cryptogamic Botany (Bryophytes and Pteridophytes)
(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 diagram wherever necessary.*

- Q1)** a) Give contributions of any bryologist from India. [4]
b) Describe sporophytes in Anthocerotales. [4]
c) Mention any four biological importance of bryophytes. [2]
- Q2)** a) Explain in brief origin of pteridophytes. [4]
b) Write on morphology of sporophyte in Equisetum. [4]
c) Comment on apospory in bryophytes. [2]
- Q3)** a) Describe evolution of sporophyte in bryophytes. [4]
b) Give an account of apogamy in pteridophytes. [4]
c) Enlist any four characters of Lepidocarpon. [2]
- Q4)** a) Give affinities of bryophytes with pteridophytes. [4]
b) Write brief account of Marsileales. [4]
c) Comment on Rhynia. [2]
- Q5)** a) Give classification of pteridophytes as per sporne (1975). [5]
b) How bryophytes acts as an indicators of water and air pollution? [5]

P.T.O.

- Q6)** a) Comment on life cycle of Lycopodium. [5]
b) Describe morphology of sporophytes in Takakiales. [5]
- Q7)** a) Give distinguishing characters of sphagnales and polytrichales. [5]
b) Write morphology of gametophytes in Ophioglossum & Osmunda. [5]
- Q8)** a) Explain morphology & anatomy of sporophytes in salviniales. [5]
b) Discuss vegetative reproduction in bryophytes. [5]



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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 1

P3056

[5536]-102

M.Sc. - I

BOTANY

**BO-1.2:Plant Physiology & Biochemistry
(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 diagram wherever necessary.*

- Q1)** a) Give the structure and functions of phytochrome. [4]
b) Explain mechanism of electron transfer system in mitochondria. [4]
c) Comment on competitive inhibitors. [2]
- Q2)** a) Write on metabolic changes occur during fruit ripening. [4]
b) Discuss synthesis of carbohydrates. [4]
c) What is nitrogen fixation? [2]
- Q3)** a) Write on factors affecting enzyme activity. [4]
b) Give the mechanism of lipid oxidation. [4]
c) Write on biological clock. [2]
- Q4)** a) Explain DNA biosynthesis and metabolism. [4]
b) Discuss Michaelis-menton equation. [4]
c) Give applications of grain moisture meter. [2]
- Q5)** a) Explain C₄ pathway and their types. [5]
b) Comment on soil plant atmosphere continuum (SPAC). [5]
- Q6)** a) Discuss cyanide resistance pathway in plants. [5]
b) Give the structure and properties of proteins. [5]
- Q7)** a) Explain mechanism of pigments synthesis. [5]
b) Comment on pectin synthesis and breakdown mechanism. [5]
- Q8)** a) Discuss nitrogen uptake and NOD factor [5]
b) Write on light harvesting complexes. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3057

[5536]-103

M.Sc.-I

BOTANY

**BO-1.3 Genetics & 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 labeled diagrams wherever necessary.*

- Q1)** a) What is epistasis? Explain mechanism of gene interaction in epistasis. [4]
b) Explain various types of mutations. [4]
c) Give applications of Genetic markers. [2]
- Q2)** a) Explain lysogenic cycles in phages. [4]
b) Describe method of induction of mutations in crop plants. [4]
c) What is nullisomic aneuploids? [2]
- Q3)** a) Comment on chloroplast gene inheritance mechanism in Mirabilis jalapa. [4]
b) Describe ordered tetrad analysis in Neurospora. [4]
c) What is Pseudoallele? [2]
- Q4)** a) Comment on plant breeding work in India. [4]
b) Write on Robertsonian translocation [4]
c) What is continuous variation? [2]

P.T.O.

- Q5)** a) Give the role of polyploidy in crop improvement. [5]
b) Write on structure & organization of eukaryotic chromosome. [5]
- Q6)** a) Explain quantitative inheritance of cob length in zea mays. [5]
b) What is transposition? Write on inducing transpositions. [5]
- Q7)** a) Explain different methods of microbial genetic transformation. [5]
b) Describe selection method in asexually propagated crops. [5]
- Q8)** a) Give the role of karyotype in plant species identification. [5]
b) Comment on cytoplasmic male sterility in plants. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

P3058

[5536]-104

M. Sc. - I

BOTANY

BO-1.4 : Botanical Techniques

(2013-Pattern) (Semester - I) (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 diagram must be drawn wherever necessary.*

- Q1)** a) Write about any four histochemical techniques with suitable examples. [4]
b) Write principle & applications of IR spectroscopy. [4]
c) Enlist the basic components of column chromatography. [2]
- Q2)** a) Explain principle & applications of affinity chromatography. [4]
b) Write about DNA microarray technique. [4]
c) What is the difference between magnification & resolution. [2]
- Q3)** a) Describe the principle of NMR spectroscopy. [4]
b) What is isoelectric focussing? write its principle & uses. [4]
c) Enlist the factors affecting centrifugation. [2]
- Q4)** a) Write principle & working of digital pH meter. [4]
b) Describe basic components of light microscope. [4]
c) What is radioactive decay? [2]
- Q5)** a) Give comparative account of different microtomes. [5]
b) Write a note on gas chromatography technique. [5]

P.T.O.

- Q6)** a) Discuss about electrophoresis of proteins. [5]
b) Enlist any five radioisotopes used in biological sciences. Write their properties. [5]
- Q7)** a) Give an account of instrumentation of UV-visible spectrophotometry. [5]
b) Describe Maxam - Gilbert's DNA sequencing method [5]
- Q8)** a) Write a note on ELISA technique. [5]
b) Explain principle & working of phase contrast microscopy. [5]

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P3060

[5536]-202

M.Sc. - I

BOTANY

BO - 2.2 : Cell Biology & Evolution

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

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.*
- 4) *Figures to the right indicate full marks.*

- Q1)** a) Define cell theory & Explain cell structure. [4]
b) Explain ultrastructure of golgi complex. [4]
c) What is sympatric speciation. [2]
- Q2)** a) Describe Miller's experiment on abiotic synthesis of organic matter. [4]
b) Give the structure of Glyoxysomes & Peroxisomes. [4]
c) Hardy-Weinberg Law. [2]
- Q3)** a) Explain cell aging and cell senescence. [4]
b) Explain role of cell signaling in biotic & abiotic stress. [4]
c) Define parapatric speciation. [2]
- Q4)** a) Explain the phases of cell cycle. [4]
b) Give ultrastructure & role of Lysosomes. [4]
c) What are Microfilaments? [2]

P.T.O.

- Q5)** a) Explain biogenesis and structure of Mitochondria. [5]
b) Give role of cyclins & protein kinase in cell cycle. [5]
- Q6)** a) Discuss spontaneity of mutations. [5]
b) Write a note on origin of new genes & proteins. [5]
- Q7)** a) What is Apoptosis? Explain the Mechanism of Apoptosis. [5]
b) Discuss RNA world theory. [5]
- Q8)** a) Describe the structure and organization of flagella. Give its role in motility. [5]
b) Explain in detail “Geological time scale”. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P3062

[5536]-204

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 air. [4]

b) Comment on ecological limits. [4]

c) Define Ecosystem. [2]

Q2) a) Explain in marine ecosystem. [4]

b) Give an account adaptive responses of plants. [4]

c) What is edge effect? [2]

Q3) a) Write on photoinhibition. [4]

b) Comment on soil nutrients. [4]

c) What is Endemism? [2]

P.T.O.

- Q4)** a) Comment on species diversity. [4]
b) Explain plant distribution with respect to migration. [4]
c) What is allogenic succession? [2]
- Q5)** a) Comment on Hydroseres. [5]
b) Give floristic regions of India. [5]
- Q6)** a) Write a note on population size. [5]
b) Explain “Diversity types”. [5]
- Q7)** a) Comment on effect of light on distribution of vegetation. [5]
b) Write a note on “Energy flow”. [5]
- Q8)** a) Give an account of types of soil. [5]
b) Describe vegetation belts of world. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P3063

[5536]-301

M.Sc. - II

BOTANY

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

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 Pteridospermales. [4]
b) Comment on morphology of Cycadales sporophytes. [4]
c) Write on alpha and omega taxonomy. [2]
- Q2)** a) Write systematic position of Aristolochiaceae. [4]
b) Comment on classification of spermatophyta as per Engler. [4]
c) Give general characters of Welwitschiales. [2]
- Q3)** a) Write on cladistics in taxonomy. [4]
b) Give phylogeny of Urticaceae. [4]
c) Comment on Cycadeoidea. [2]
- Q4)** a) Give general characters and affinities of Coniferales. [4]
b) Give an outline of Cronquist system of classification. [4]
c) What is endemism? [2]
- Q5)** a) Describe male and female strobili of Pentoxylon. [5]
b) Explain categories and ranks in systematics. [5]

P.T.O.

- Q6)** a) Comment on sporophytes and gametophytes of Ephedrales. [5]
b) Write inter-relationships and economic importance of Magnoliaceae. [5]
- Q7)** a) Give affinities of angiosperms with pteridophytes. [5]
b) Comment on Post-Darwinian system of classification of angiosperms. [5]
- Q8)** a) Give general characters of Gnetales. [5]
b) Describe phytogeographic regions of India. [5]



Total No. of Questions :8]

SEAT No. :

P3064

[5536]-302

[Total No. of Pages : 2

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 extrinsic factors affecting plant development. [4]
b) Give an account of monocot embryo development. [4]
c) Explain the term determination. [2]
- Q2)** a) Discuss on hormonal control in plant development . [4]
b) Give source, method of cultivation of grapes. [4]
c) What are seed dormancy? What are causes for it. [2]
- Q3)** a) Give an account of vegetative development. [4]
b) Comment on development of female gametophyte. [4]
c) Write on apical dominance. [2]
- Q4)** a) Explain importance of light mediated signaling during plant development. [4]
b) State source and economic importance of eucalyptus oil and ginger. [4]
c) What is chemotropism? [2]
- Q5)** a) Explain the process of organ development. [5]
b) What is apomixis? Give an account of apomixis. [5]

P.T.O.

- Q6)** a) What is anther and pollen culture explain its role in understanding plant development. [5]
b) Comment on rubber industry. [5]
- Q7)** a) Give an account of coordinated development. [5]
b) Explain molecular genetics of gametophytic development. [5]
- Q8)** a) Write on “ megasporogenesis”. [5]
b) Give source and method of cultivation of strawberry. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

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[5536]-303

M.Sc.

BOTANY

BO-3.3: Industrial Botany-I

(2013 Pattern) (Semester -III) (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 diagrams wherever necessary.*

- Q1)** a) Give an account of method of beer production. [4]
b) Comment on distribution of economically important algae in India. [4]
c) Enlist environmental implications of fossil fuel. [2]
- Q2)** a) Give the difference between management & administration. [4]
b) Describe method of bioethanol production from Lignocellulose. [4]
c) Mention microbial strain used in fermentation. [2]
- Q3)** a) Discuss the process of liquid seaweed fertilizers preparation. [4]
b) Comment on traditional fungal foods. [4]
c) What is NABARD ? [2]
- Q4)** a) Comment on methanogenesis from agro industrial residues. [4]
b) Elaborate the concept of entrepreneur w.r.t. characteristics & functions. [4]
c) What is algal technology? [2]

P.T.O.

- Q5)** a) Discuss resource potential of algae w.r.t. food & feed. [5]
b) Comment on process of project identification & selection. [5]
- Q6)** a) Explain distillation to dehydration process of bioethanol production. [5]
b) Write on production of Dhingri mushroom. [5]
- Q7)** a) Comment on business w.r.t. objectives & scopes. [5]
b) Discuss bacterial & viral biopesticides. [5]
- Q8)** a) Describe the process of lipid derived biofuels. [5]
b) Comment on sources & method of production of cephalosporins. [5]



Total No. of Questions :8]

SEAT No. :

P3066

[Total No. of Pages : 2

[5536]-304

M. Sc. - II

BOTANY

**BO-3.41 : Advanced Mycology and Plant Pathology
(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) Give an account of Bessey's system of classification of fungi [4]
b) Explain Plasmodiophoromycota. [4]
c) What are Labyrinthulomycota. [2]
- Q2)** a) State any four ecological groups of fungi. [4]
b) Comment on fungal growth. [4]
c) Describe any two sexual spores in fungi. [2]
- Q3)** a) Discuss Hemiascomycetes. [4]
b) Explain relationship of fungi with plants and animals [4]
c) Write the concept of Biohydrometallurgy. [2]
- Q4)** a) Give an account of chytridiomycota. [4]
b) Why fungi are model organisms for genetical studies. [4]
c) Mention contributions of Anton Debary. [2]
- Q5)** a) Explain Trichomycetes. [5]
b) How Gasteromycetes are interesting fungi. [5]

P.T.O.

- Q6)** a) What are Deuteromycota? Add a note on conidiogenesis. [5]
b) Comment on different aspects of lichens. [5]
- Q7)** a) Discuss in detail ruderal and stress tolerant strategies in fungi. [5]
b) Describe various aspects of smut fungi. [5]
- Q8)** a) Explain sporangia to conidial evolution in Mucorales. [5]
b) Give an account of Tinea and its clinical aspects. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

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[5536]-305

M. Sc. - II

BOTANY

BO-3.42 : Advanced Angiosperms

(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) *Draw neat labelled diagram whenever necessary.*

- Q1)** a) Describe silent features of Gentianacere. Describe floral variation in it. [4]
b) Comment an Cladistic and Cladogram [4]
c) What is genetic variation. [2]
- Q2)** a) Explain serological data is useful in solving taxonomic problem. [4]
b) Explain RAPD technique used in taxonomy. [4]
c) Write on parsimony analysis. [2]
- Q3)** a) Discuss SEM and TEM studies in systematics. [4]
b) What is Numerical Taxonomy? Give its merits, demerits and applications. [4]
c) What is L/O pattern. [2]
- Q4)** a) Describe wood elements in detail. Justify their importance in taxonomy. [4]
b) Comment on role of catkin inflorescence in taxonomy. [4]
c) Write briefly on xerophytic adaptations. [2]

P.T.O.

- Q5)** a) Explain the concept of speciation [5]
b) Comment on scope & limitations of cytotaxonomy. [5]
- Q6)** a) Discuss systematic position of Dioscoreaceae. [5]
b) What is plastids? Describe their role in classification of higher taxa. [5]
- Q7)** a) Describe the role of proteins in taxonomy. Add a note on techniques of protein electrophoresis. [5]
b) State different criteria for use of chemical in plant taxonomy. [5]
- Q8)** a) Describe phytogeographical regions of the world. [5]
b) Give Phylogeny & Economic importance of Pandanaceae [5]



Total No. of Questions :8]

SEAT No. :

P3068

[Total No. of Pages : 2

[5536]-306

M. Sc. - II

BOTANY

BO-3.43: Advanced Plant Physiology

(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) Write on chlorophyll fluorescence kinetics [4]
b) What is photoperiodism? Comment on SDP with its examples [4]
c) Give role of auxin in plants. [2]
- Q2)** a) Describe the role of respiration in plant carbon balance. [4]
b) Comment on role of growth regulators in plant growth. [4]
c) What is mineral assimilation. [2]
- Q3)** a) Give significance of cyanide resistance pathway [4]
b) Explain the role of microbes in availability of nutrient [4]
c) What is vernalization. [2]
- Q4)** a) Comment on relative growth in plants [4]
b) Write physiology of seed germination [4]
c) Describe role played by ethylene in fruit ripening. [2]

P.T.O.

- Q5)** a) Explain CAM pathway in aquatic plants [5]
b) Discuss factors influencing transport of water [5]
- Q6)** a) Describe the physiological traits for improving of crop. [5]
b) Give an account of strategies developed by plants for conservation of water [5]
- Q7)** a) Comment on acidosis metabolism during fruit development and seed germination [5]
b) Discuss relative growth rate and net assimilation rate [5]
- Q8)** a) Explain the biosynthesis of any one secondary metabolites [5]
b) Give an account of signal cell C_4 photosynthesis [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

P3069

[5536]-307

M. Sc. - II

BOTANY

BO-3.44 : Advanced Genetics and Molecular Biology

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

Time : 3 Hours]

[Max. Marks : 80

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 eukaryotic chromosome. [4]
b) Describe genetic organisation of T₄ bacteriophage. [4]
c) Comment on satellite chromosome. [2]
- Q2)** a) Comment on interaction between plasmid and host. [4]
b) Explain the structure of r II locus. [4]
c) Write on pilus production in plasmid. [2]
- Q3)** a) Describe lampbrush chromosome. [4]
b) Explain the micro satellite. [4]
c) Write on enzyme polymorphism. [2]
- Q4)** a) Explain Morphogenesis and Maturation of T₄ bacteriophage. [4]
b) Concept on gene silencing. [4]
c) Write a concept of restriction mapping. [2]
- Q5)** a) Describe Hardy-Weinberg law of gene frequencies. [5]
b) Give the structure of prokaryotic transposable elements. [5]

P.T.O.

- Q6)** a) Explain DNA Typing and Population structure. [5]
b) Describe in details single nucleotide polymorphism. [5]
- Q7)** a) Give an account of wheat gluten protein. [5]
b) Write a concept of restriction maps. [5]
- Q8)** a) Discuss automated DNA sequencing method. [5]
b) Give method of detection of Duplications and Inversions. [5]

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Total No. of Questions :8]

SEAT No. :

P3070

[Total No. of Pages : 2

[5536]-308

M. Sc. - II

BOTANY

**BO-3.45 : Advanced Plant Biotechnology
(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) What is vector? Give role of plasmid vector in gene cloning. [4]
b) Explain the mechanisms of gene inhibition at RNA level. [4]
c) Write speciality of the plant bioreactors. [2]
- Q2)** a) Give an account of resistance induced in plant by using phosphinothricine glyphosate gene. [4]
b) State scope and applications of in vitro secondary metabolite production. [4]
c) Which micro organisms genome was first sequenced [2]
- Q3)** a) Comment on use of various enzymes in recombinant DNA technology. [4]
b) Write note on knock out mutant. [4]
c) Describe the terms : Explant and Callus. [2]
- Q4)** a) Explain mechanism of induction of diseases resistance within plant by using RIP gene. [4]
b) Write on Biotransformation. [4]
c) Enlist five transgenic plants. [2]

P.T.O.

- Q5)** a) What are DNA libraries? Explain various steps in preparation of DNA libraries. [5]
b) Comment on northern hybridization technique. [5]
- Q6)** a) Give an account of Bt - Cotton. [5]
b) Explain development of herbicide resistance plant by using sulphonyl urea gene. [5]
- Q7)** a) Discuss southern hybridization techniques and Write its applications [5]
b) Comment on ESTs technique. [5]
- Q8)** a) State strategies to develop Nematode resistance plant. [5]
b) Give an account of pathway engineering for enhancing secondary metabolites production [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

P3071

[5536]-309

M. Sc.

BOTANY

BO-3.46 : Advanced Medicinal 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 diagrams must be drawn*

- Q1)** a) Comment on Ayurvedic System of Medicine. [4]
b) Write a note on Morphological and Microscopical method of drug evaluation. [4]
c) What is drug adulteration with examples [2]
- Q2)** a) Discuss Cultivation and Utilization of medicinal plants in India [4]
b) Comment on Biosynthesis of glycosides [4]
c) Define pharmacognosy. [2]
- Q3)** a) Write Down Source, Cultivation, Collection, Macroscopic Characters and Applications of Digitalis [4]
b) What is drug evaluation? Explain physical method of evaluation [4]
c) What is quality control of herbal drug [2]
- Q4)** a) Enlist classification of Ayurvedic system. Give detail account of any two systems [5]
b) Write a note on biogenesis of phytopharmaceuticals [5]
- Q5)** a) Comment on plant tissue culture for phytopharmaceuticals. [5]
b) Write down Ayurvedic Profile of Indian Senna [5]

P.T.O.

- Q6)** a) Comment on pesticides purethrum as a natural pesticide [5]
b) Describe Neutraceuticals and Cosmeceuticals [5]
- Q7)** a) Explain the phenomenon of quality control of herbal drug [5]
b) Give applications of Isabgol and Arjun [5]
- Q8)** a) Discuss the principle, formulation and Ayurvedic Profile of Behra Drug [5]
b) Write case study of any one Ayurvedic medicinal product in India [5]

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Total No. of Questions :8]

SEAT No. :

P3072

[5536]-311

[Total No. of Pages :2

M.Sc.

BOTANY

**BO - 3.48 : Advanced Seed Technology
(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) Comment on important seed industries in India. [4]
b) Describe the structure of seed. [4]
c) What is grow out test? [2]
- Q2)** a) Explain seed Vigour and seed ageing. [4]
b) Comment on seed health testing methods. [4]
c) What is seed? [2]
- Q3)** a) Describe classes of seeds. [4]
b) Give economic impact of seed borne diseases. [4]
c) What is artificial Seeds? [2]
- Q4)** a) Give an account of maintenance of breeders seed in self pollinated crops. [4]
b) Comment on specific gravity separator. [4]
c) What is ISTA? [2]

P.T.O.

- Q5)** a) Write note on ELISA. [5]
b) Describe preventive measures of seed deterioration. [5]
- Q6)** a) Comment on relation of insects and plants. [5]
b) Explain integrated management of seed borne diseases. [5]
- Q7)** a) Give an account of minimum seed certification standards. [5]
b) Discuss packing and handling of seeds. [5]
- Q8)** a) Describe seed germination tests. [5]
b) Give construction and working of Pre-cleaners. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

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[5536]-312

M.Sc.-II

BOTANY

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

Time : 3Hours]

[Max. Marks : 50

Instructions to the candidates:

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

- Q1)** a) Describe bryophyte diversity w.r.t. species, habit, habitat, and distribution at taxonomic level. [4]
- b) Explain the perspectives and importance of biodiversity. [4]
- c) Comment on allozymes. [2]
- Q2)** a) Write on gymnosperm diversity w.r.t. habit, habitat and evolutionary success at taxonomic level. [4]
- b) Describe in brief about species richness and species abundance. [4]
- c) Comment on classification of ecosystems. [2]
- Q3)** a) Explain in brief identification of diversity hotspots. [4]
- b) Discuss diversity indices based on species. [4]
- c) Give the factors affecting ecosystem degradation and loss. [2]
- Q4)** a) Give role of national parks in situ conservation. [4]
- b) Write on chipko movement. [4]
- c) Comment on conservation of genetic diversity. [2]

P.T.O.

- Q5)** a) Write on endemism and Biodiversity. [5]
b) Give common features of threatened species. [5]
- Q6)** a) Discuss loss of Agrobiodiversity. [5]
b) Comment on global distribution of biodiversity. [5]
- Q7)** a) Give role of educational institutes in biodiversity conservation. [5]
b) Mention factors affecting species distribution. [5]
- Q8)** a) Explain the role of biotechnology in assessment of biodiversity. [5]
b) Comment on seed banks and test-tube gene banks? [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages : 2

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[5536]-401

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 and labelled diagrams wherever necessary.*

- Q1)** a) Calculate mean, mode, median from given data
32, 35, 31, 34, 32, 37, 34, 38, 33, 34, 33, 35, 37 [4]
- b) Give an account of types of correlation [4]
- c) Write on Hypothesis [2]
- Q2)** a) What is Bioinformatics? Comment on databases. [4]
- b) Write on Haemocytometry. Mention its role [4]
- c) Differentiate between molarity and molality [2]
- Q3)** a) Discuss in detail principles of field designs [4]
- b) What is sampling? Describe various methods of sampling [4]
- c) Write on variance and co-variance (Cv) [2]
- Q4)** a) What is Normality? How much NaOH is required to prepare 500ml of 0.1 N NaOH [4]
- b) Write a note on BLAST [4]
- c) What is a buffer? Give one example. [2]

P.T.O.

- Q5)** a) In a monohybrid cross Mendel crossed yellow seeded variety of Pisum sativum with Green seeded variety. F₂ progenies are segregated in 84 yellow and 16 green seeds. By using χ^2 - test find out does the results agree with expected ratio at 5% level of significance. [5]
- b) Explain multiple sequence allignments [5]
- Q6)** a) What is pH? Explain methods of pH measurement. [5]
- b) Write on Kurtosis. Explain different types of Kurtosis [5]
- Q7)** a) Explain Randomized Block Design (RBD) and its advantages. [5]
- b) Write various methods of preparation of media [5]
- Q8)** a) Differentiate between parametric and non parametric tests [5]
- b) Comment on Man-whitney U-Test [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[5536]-402

M.Sc. - II

BOTANY

**BO - 4.2 : Plant - Organism Interactions
(2013 Course) (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 diagrams must be drawn wherever necessary.*

- Q1)** a) Explain any two parasitic plant-plant association.
b) Give an account of grazing animals-plant Interactions.
c) Write briefly on endophytic fungi.
- Q2)** a) Describe any two carnivorous plants in detail.
b) Comment on allelopathy.
c) What is mimicry?
- Q3)** a) How genetic engineering acts as tool for improving tolerance against herbivores?
b) Discuss various aspects of epiphytic plants.
c) Comment on algae-coral association.
- Q4)** a) Explain competitive mechanisms in plants.
b) Describe insect-fungal symbiosis.
c) Briefly write on Thermogenesis.
- Q5)** a) Write on ectomycorrhize and ectendomycorrhizae with examples.
b) Discuss forms of lichens.

P.T.O.

- Q6)** a) Describe with examples contrivances for self pollination.
b) Comment on interactions in plant and nodulating bacteria.
- Q7)** a) What is cross pollination? Write characteristics of cross pollinated plants.
b) How fruit and seed morphology relevant to animal dispersal mechanism.
- Q8)** a) Explain co-evolution of pollinator and plant flower structure.
b) Describe types of endomycorrhizae citing examples.



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

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[5536]-404

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

Q1) a) Explain the concept of plant disease epidemiology. **[4]**

b) Give an account of biochemical defence in plants. **[4]**

c) Write the names of two viral diseases with their causal organisms. **[2]**

Q2) a) Give an account on the role of temperature and humidity in disease development. **[4]**

b) What is disease cycle? Differentiate between penetration and infection. **[4]**

c) Write on tyloses. **[2]**

Q3) a) Give an account of physiological specialization and adaptation of fungi to different hosts. **[4]**

b) Comment on symptoms of plant diseases. **[4]**

c) Enlist enzymes and toxins in plant diseases. **[2]**

P.T.O.

- Q4)** a) Write notes on vertical and horizontal resistance in plants. [4]
b) Give an account on the pathogenicity of necrotrophic pathogens. [4]
c) Explain plant disease forecasting. [2]
- Q5)** a) Describe the role of biotechnology in plant pathology. [5]
b) Comment on post harvest diseases of fruits and vegetables. [5]
- Q6)** a) Discuss the breeding methods for improving resistance in plants. [5]
b) Give an account of classification of plant diseases. [5]
- Q7)** a) Describe any two methods for assessment of plant disease. [5]
b) Comment on the chemical control of plant diseases. [5]
- Q8)** a) Give an account of biological and chemical activators of resistance in plants. [5]
b) Write an pathogenesis and avirulence gene. [5]

