

Total No. of Questions : 8]

SEAT No :

P 1636

[5129]-101

[Total No. of Pages :2

M.Sc.-I

BOTANY

BO:1.1: Cryptogamic Botany (Part-I)
[Bryophytes and Pteridophytes]
(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 labelled diagrams wherever necessary.*

- Q1)** a) Write affinities of bryophytes with thallophyta. [4]
b) Describe bryophytes as indicators of water and air pollution. [4]
c) Write on contribution of any one Bryologist from India. [2]
- Q2)** a) Explain pteridophycean hypothesis in relation to origin of Bryophytes. [4]
b) Discuss apogamy and apospory in bryophytes. [4]
c) Comment on theory of sterilization with respect to evolution of sporophyte in bryophytes. [2]
- Q3)** a) Describe morphology of gametophyte in Metzerialiales. [4]
b) Explain sporophytes of Marchantiales (any two). [4]
c) Give any four distinguishing characters of Calobryales. [2]
- Q4)** a) Explain biological importance of Anthoceros sporophyte. [4]
b) Describe morphology and anatomy of sporophyte in any one member of Polytrichales. [4]
c) Comment on sporophyte of Eubryales. [2]

P.T.O.

- Q5)** a) Describe Teleome theory and any five distinguishing characters of pteridophytes. [5]
b) Write classification of Pteridophytes as per Sporne system (1975) of classification. [5]
- Q6)** a) Comment on Annularia. [5]
b) Give an account on Sigillaria. [5]
- Q7)** a) Write anatomy of sporophyte in Psilotum and Tmesipteris. [5]
b) Explain gametophytes of Lycopodiales. [5]
- Q8)** a) Comment on morphology of Equisetales. [5]
b) Describe morphology of Sporophyte in Salviniales. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P1637

[5129] - 102

M.Sc.

BOTANY -I

**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 diagrams wherever necessary.*

- Q1)** a) Discuss the 'michaelis menton equation. [4]
b) State the metabolic changes occurs during seed germination. [4]
c) What is a photoperiodism. [2]
- Q2)** a) Give an overview of Glycolysis. [4]
b) Write note on phospholipids. [4]
c) Explain binding energy. [2]
- Q3)** a) Describe the C_H cycle. [4]
b) Write note on brassinosteroids. [4]
c) What are the purines. [2]
- Q4)** a) Explain the mechanism of signal transduction in guard cell. [4]
b) Discuss photosynthetic pigment system. [4]
c) What are the phototropins. [2]

P.T.O.

- Q5)** a) Explain cyclic electron flow in photosynthesis. [5]
b) Describe the process of amino acid biosynthesis. [5]
- Q6)** a) State principle working and applications of chlorophyll flurometer. [5]
b) Explain the tolerance mechanism of plants to biotic stress. [5]
- Q7)** a) Explain the CAM pathway of succulent plants. [5]
b) Give general classification of phenolics. [5]
- Q8)** a) Write the mechanism of root modulation and nitrogen fixation. [5]
b) Describe the process of ATP synthesis. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P1638

[5129]-103

[Total No. of Pages :2

M.SC.

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

- Q1)** a) Explain inheritance of shells in snail (*Limnea*) [4]
b) Give an account of genetic marker. [4]
c) Write the difference between qualitative and quantitative traits. [2]
- Q2)** a) Discuss importance of genetic diversity in conservation of genetic resources [4]
b) Write mechanism of generalized transduction. [4]
c) Give the role of karyotyping in plant species identification. [2]
- Q3)** a) Explain complementary gene interaction with suitable example. [4]
b) Comment on Marker assisted selection. [4]
c) Mention the role of polyploidy in plant breeding. [2]
- Q4)** a) Describe methods of asexual reproduction in crop plants. [4]
b) Comment on applications of distant hybridization in crop improvement. [4]
c) State Hardy- Weinbergs law. [2]

P.T.O.

- Q5)** a) Write mechanism of tetrad analysis in Yeast. [5]
b) Describe clonal selection method for asexually propagated crops. [5]
- Q6)** a) Write principles of combination breeding and its applications. [5]
b) Briefly write on method of induction of mutation in crop plants. [5]
- Q7)** a) Explain lytic and lysogenic cycle in phages. [5]
b) Comment on homologous and nonhomologous recombination. [5]
- Q8)** a) Explain Meiotic behaviour of translocation heterozygote. [5]
b) Discuss the factor affecting gene and genotype frequency. [5]



Total No. of Questions : 8]

SEAT No. :

P1639

[5129]-104

[Total No. of Pages : 2

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) *Neat labelled diagram must be drawn wherever necessary.*

Q1) a) Give concept of magnification and add a note on resolution. [4]

b) Write briefly on SEM. [4]

c) What is maceration? [2]

Q2) a) Comment on confocal microscopy. [4]

b) Explain PAGE. [4]

c) Give difference between paper chromatography and TLC method. [2]

Q3) a) What is micrometry? Give its applications. [4]

b) Give concept of partition coefficient. [4]

c) Write principles of Electrophoretic technique. [2]

Q4) a) Give working and applications of spectrophotometer. [4]

b) Explain ion-exchange chromatography. [4]

c) What is molar extinction coefficient. [2]

P.T.O.

- Q5)** a) Explain pulsed-field Electrophoresis. [5]
b) Give an account of autoradiography. [5]
- Q6)** a) What is centrifugation? Discuss technique of ultracentrifugation. [5]
b) Comment on electrical conductivity. [5]
- Q7)** a) Explain Sanguer's method. [5]
b) Write on DNA micro array method. [5]
- Q8)** a) Comment on ELISA. [5]
b) Give an account of Agarose Gel Electrophoresis. [5]



Total No. of Questions : 8]

SEAT No. :

P1640

[5129]-201

[Total No. of Pages :2

M.Sc.-I

BOTANY

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

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) Write about pigment constitution in algae. [4]
b) Give the outline classification of algae upto order level as proposed by bold and wyne. [4]
c) Explain the concept of systematics. [2]
- Q2)** a) Describe the structure of thallus in Euglenophyta. [4]
b) Comment on the ecological importance of Lichens [4]
c) Mention the types of Mycorrhiza. [2]
- Q3)** a) Give the outline classification of fungi (up to class level) as proposed by Ainsworth etal 1973. [4]
b) Write any four distinguishing characters of mastigo mycotina. [4]
c) Describe the life cycle pattern in Zygomycotina. [2]
- Q4)** a) Describe any two stages in parasexual cycle. [4]
b) Write about the concept of Hamathecium. [4]
c) Mention any two types of Basidiocarps. [2]

P.T.O.

- Q5)** a) Give an account on the reproduction in Stigonematales [5]
b) Comment on the evolution of Thallus in Algae. [5]
- Q6)** a) Explain the life cycle pattern in Xanthophyta. [5]
b) Describe the structure of thallus in Chrysophyta. [5]
- Q7)** a) Write on the evolution of asexual reproduction in Zygomycotina [5]
b) Describe the structure of reproductive bodies in Myxomycotina. [5]
- Q8)** a) Explain any two types of fructifications in Deuteromycetes. [5]
b) Discuss the life cycle pattern in Euascomycetes. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P1641

[5129] - 202

M.Sc. -I

BOTANY

**BO-2.2: Cell Biology and Evolution
(2013 Pattern) (Semester - II) (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 diagram must be drawn wherever necessary.*

- Q1)** a) Explain fluid mosaic model of plasma membrane. [4]
b) Give an account of Biotic and abiotic stress signaling mechanism with suitable examples. [4]
c) Write function of nucleus. [2]
- Q2)** a) Discuss Darwins concept of evolution. [4]
b) Comment on aspects of cell organelles during apoptosis. [4]
c) What is convergent evolution. [2]
- Q3)** a) Give an account of flow cytometry technique. [4]
b) Discuss calmodulin cascade signaling. [4]
c) Write function of Ribosomes. [2]
- Q4)** a) Give an account of ultra structure of golgi complex. [4]
b) Explain assembly and dissociation of ribosome subunits. [4]
c) Write on gene frequency. [2]

P.T.O.

- Q5)** a) Explain the concept of Oparin and Halden Model of evolution. [5]
b) Describe molecular organisation and biogenesis of Mitochondria. [5]
- Q6)** a) Give an account of ultrastructure of ER. [5]
b) Discuss the structure and organisation of flagella. [5]
- Q7)** a) Describe the nature and types of fossil. [5]
b) Discuss role of molecular tools in phylogeny. [5]
- Q8)** a) Explain calmoduling cascade signaling. [5]
b) Give an account of flow cytometry technique. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P1642

[5129]-203

[Total No. of Pages : 2

M.Sc. - I

BOTANY

**BO - 2.3 : Molecular Biology and 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 labelled diagrams must be drawn wherever necessary.*

- Q1)** a) Explain the mechanism of eukaryotic DNA replication. [4]
b) How RNA acts as a genetic material. [4]
c) Comment on photoactivation. [2]
- Q2)** a) Give mechanism of transcription in prokaryotes. [4]
b) Discuss on Tryptophan operon. [4]
c) Write on ribonucleoproteins. [2]
- Q3)** a) Explain the role of BACs & YACs in gene cloning & Give their properties. [4]
b) Give the role of polymerases & DNA methylases in genetic engineering. [4]
c) What are exons? [2]
- Q4)** a) What is genomic DNA library? Write steps for preparation of genomic DNA library. [4]
b) Give procedure of southern blotting. [4]
c) Enlist methods of direct gene transfer in plants. [2]

P.T.O.

- Q5)** a) Discuss chemical & physical properties of nucleic acids. [5]
b) Write on enzymes involving in DNA repair mechanism. [5]
- Q6)** a) Discuss RNA processing during transcription. [5]
b) Explain in brief organization & structure of prokaryotic gene. [5]
- Q7)** a) Describe mechanism of protein synthesis in eukaryotes. [5]
b) Comment on construction of recombinant DNA molecule. [5]
- Q8)** a) Give the applications of genetic engineering in development of fungal & insect resistant plants. [5]
b) Describe indirect gene transfer method in plants. [5]

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Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P1643

[5129]-204

M.Sc.-I

BOTANY

**BO- 2.4 : Plant Ecology and Phytogeography
(2013 Pattern) (Credit System) (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 diagram wherever necessary.*

- Q1)** a) What is the effect of light on the plants? [4]
b) Give the concept of metapopulation. [4]
c) Comment on the causes of noise pollution [2]
- Q2)** a) Write on carbon sequestration. [4]
b) What is endemism? Explain with suitable examples. [4]
c) Write on edge effect. [2]
- Q3)** a) Which topographic factors affect the plant distribution? [4]
b) Explain population viability analysis. [4]
c) Comment on artificial ecosystem. [2]
- Q4)** a) Discuss levels of diversity. [4]
b) How do plants protect themselves against light induced damage? [4]
c) What are the climatic zones of India? [2]
- Q5)** a) What are the causes of air pollution? [5]
b) Which factors affect the size of the population? [5]

P.T.O.

- Q6)** a) Discuss life history strategies with reference to C-S-R triangle. [5]
b) What is hydrosere? [5]
- Q7)** a) Explain energy flow model in ecosystems. [5]
b) State floristic regions of India. [5]
- Q8)** a) What is habitat ecology? Explain with respect to desert ecology. [5]
b) Discuss the relation of soil and soil microbes [5]



Total No. of Questions : 8]

SEAT No :

P 1644

[5129]-301

[Total No. of Pages :2

M.Sc. -II

BOTANY

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

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) Discuss affinities of Gnetales with angiosperms. [4]
b) Give general characters of pentoxylales. [4]
c) Write on Caytonia. [2]
- Q2)** a) Give salient features of Ginkgoales. [4]
b) Explain species concept. [4]
c) Mention economic importance of Gymnosperms. [2]
- Q3)** a) Briefly write on Angiosperm phylogeny group (APG). [4]
b) Comment on cladistics in Taxonomy. [4]
c) Write on Lyginopleris. [2]
- Q4)** a) Explain Endemism in Western Ghats. [4]
b) Give classification of gymnosperms as per sahani (1920). [4]
c) Mention economic importance of Moraceae. [2]
- Q5)** a) Describe male and female cone in Ginkgoales. [5]
b) Give characteristics of Gymnosperms and add a note on its distribution in world. [5]

P.T.O.

- Q6)** a) Write provisions for the governance of ICBN. [5]
b) Discuss phylogeny and economic importance of Alismataceae. [5]
- Q7)** a) Explain merits and demerits of Cronquist system of classification. [5]
b) Describe phytogeographic regions of India. [5]
- Q8)** a) Give an outline of thorne system of classification. [5]
b) Comment on morphological variation and systematic position of Aponogetonaceae. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P1645

[5129] - 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) *Answer any five questions.*
- 2) *All questions carry equal marks.*
- 3) *Draw neat labelled diagram wherever necessary.*

- Q1)** a) Explain the concept of polarity and symmetry. [4]
b) Describe the morphological and histological changes during transition from vegetative to reproductive phase. [4]
c) Distinguish between differentiation and dedifferentiation. [2]
- Q2)** a) What is the role of auxin in controlling plant development? [4]
b) Comment on the source, method of cultivation and economic importance of clove and eucalyptus. [4]
c) Write on economic importance of pulses. [2]
- Q3)** a) Justify: Meristem is a dynamic centre of cell regeneration. [4]
b) Discuss the steps in carpel development. [4]
c) What is totipotency? [2]
- Q4)** a) Write on pollen culture and its significance. [4]
b) Explain method of tea cultivation. [4]
c) What is apomixis? [2]

P.T.O.

- Q5)** a) Explain intrinsic and extrinsic factors in plant development. [5]
b) What is double fertilization? Write its significance. [5]
- Q6)** a) Discuss ABC model of flower development. [5]
b) Comment on sugar industry and its products. [5]
- Q7)** a) Explain development of monocot embryo. [5]
b) Write on molecular basis of shoot development. [5]
- Q8)** a) Comment on cultivation and uses of Cardamom and Saffron. [5]
b) What is plant development? Write its unique characters. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P1646

[5129]-303

M.Sc.-II

BOTANY - II

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) What are energy crops? Describe any two sugar crops. [4]
- b) Elaborate the concept of entrepreneur with respect to characteristics, types & functions. [4]
- c) Name the herbal biopesticides. Write their significance. [2]
- Q2) a) Explain the types of fermentation process. [4]
- b) Describe cultivation & extraction methods of biodiesel from algae. [4]
- c) Write functions of SIDBI. [2]
- Q3) a) List the different institutes which provide support to small entrepreneurs. Write on any one of them. [4]
- b) Give an account of methods of wine production. [4]
- c) What are microalgae? Enlist their examples & uses. [2]
- Q4) a) Discuss mass multiplication & applications of Trichoderma. [4]
- b) Give importance of different alternatives for fossil fuels. [4]
- c) Name the microorganisms used in citric acid production. [2]

P.T.O.

- Q5)** a) Write the methods of preparation & applications of liquid sea weed fertilizer. [5]
b) What is batch fermentation? Add a note on fed-batch fermentation. [5]
- Q6)** a) Comment on business with respect to characteristics, objectives & scope. [5]
b) Describe the process of fuel production of lipid derived biofuels. [5]
- Q7)** a) Write about production of Dhingri Mushroom. [5]
b) Explain the distillation & dehydration process of bioethanol production. [5]
- Q8)** a) Comment on bacterial & viral biopesticides. [5]
b) What is entrepreneurship development program? Explain the need & objectives of entrepreneurship. [5]



Total No. of Questions : 8]

SEAT No. :

P1647

[5129]-304

[Total No. of Pages : 2

M.Sc.-II

BOTANY

**BO-3.41: Advanced Mycology and Plant Pathology
(2013 Pattern) (Semester - III) (Credit System) (New) (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 Alexopoulos system of classification of fungi... [4]
b) What are protosteliomycetes? [4]
c) Write contributions of K.C. Mehta. [2]
- Q2)** a) Briefly write on downy mildew fungi. [4]
b) Discuss cellular slime moulds. [4]
c) Write on Labyrinthulomycota. [2]
- Q3)** a) Comment on teliospore morphology in smuts. [4]
b) Explain plasmodial types in myxomycetes. [4]
c) Describe any four spore types in fungi. [2]
- Q4)** a) Give an account of life cycle pattern in plasmodiophoromycota. [4]
b) State relationship of fungi with plants and animals. [4]
c) With example write on Hyphochytridiomycota. [2]

P.T.O.

- Q5)** a) What are purenomycetes? Add a note on ascomata & its types. [5]
b) Explain types of mycorrhizae. [5]
- Q6)** a) Comment on mycetoma and candidiasis. [5]
b) Discuss types of conidiomata in anamorphic fungi. [5]
- Q7)** a) What are Gasteromycetes? [5]
b) Comment on Loculoascomycetes fungi. [5]
- Q8)** a) Justify: “Rusts have differential teliospore morphology”. [5]
b) Write on Dacrymycetales and Auriculariales. [5]



Total No. of Questions : 8]

SEAT No. :

P1648

[5129]-305

[Total No. of Pages : 2

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) Justify: Embryological characters are of taxonomically important. [4]
b) Comment on phenetic methods in taxonomy. [4]
c) What is ecological variations? [2]
- Q2)** a) Discuss systematic position of orchidoceae. [4]
b) Explain RFLP techniques in systematics. [4]
c) Write on Karyotype. [2]
- Q3)** a) Explain anatomical data is useful in solving taxonomic problems. [4]
b) Comment on ecological variations in plant systematics. [4]
c) Give economic importance of Arecaceae. [2]
- Q4)** a) Describe different stages in chemotaxonomic investigations. [4]
b) Give molecular data and systematic position of Hydotellaceae. [4]
c) What is polynogram? [2]

P.T.O.

- Q5)** a) Discuss systematic position of passifloraceae. [5]
b) Comment on Cytotaxonomy. [5]
- Q6)** a) Justify: Pollen characters are taxonomically important. [5]
b) Give phylogeny and economic importance of Arecaceae. [5]
- Q7)** a) Explain role of RAPD techniques in plant systematics. [5]
b) State principles for construction of taxonomic groups. [5]
- Q8)** a) Give scope and limitation of cytotaxonomy. [5]
b) Explain 'Cladistics'. [5]



Total No. of Questions : 8]

SEAT No. :

P1649

[5129]-306

[Total No. of Pages : 2

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) Comment on water conservation strategies in plants. [4]
b) Write on source & sink relationship. [4]
c) What is stress physiology. [2]
- Q2)** a) Write briefly on evolution of RUBISCO. [4]
b) Explain the role of secondary metabolites in plant defense. [4]
c) Write on acidosis. [2]
- Q3)** a) Give an account of Nitrogen assimilation in plants. [4]
b) Explain the mechanism of plant protection against stress. [4]
c) Give diagrammatic representation of ETS chain. [2]
- Q4)** a) Explain CO₂ response curve. [4]
b) Give an account of mechanism of cyanide resistance respiration. [4]
c) Give role of cytokinin in plants. [2]

P.T.O.

- Q5)** a) Give an account of metabolism & allocation of resources during vegetative growth. [5]
b) Write on factors affecting water transport in plants. [5]
- Q6)** a) Give an intermediates of C_3 cycles. [5]
b) Explain biosynthetic pathway of Auxins. [5]
- Q7)** a) Comment on methods of application of chemical fertilizers. [5]
b) Add a note on PEPcace evolution. [5]
- Q8)** a) Give an account of physiology of fruit development. [5]
b) Explain role of growth regulators in plants growth. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 2

P1650

[5129]-307

M.Sc. - II

BOTANY

**BO - 3.44 : Advanced Genetics & Molecular Biology.
(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 molecular structure of Centromere & telomere. [4]
b) Write on copia transposable element in Drosophila. [4]
c) Explain d chromosome. [2]
- Q2)** a) Comment on broad host range plasmids. [4]
b) Describe types of mutations observed in the T₄ genome. [4]
c) Write on transfer DNA replication in plasmids. [2]
- Q3)** a) Give classification & nomenclature of wheat gluten proteins. [4]
b) Explain DNA typing & population structure. [4]
c) Write on gene silencing. [2]
- Q4)** a) Describe circular chromosome segregation. [4]
b) Comment on nucleotide sequencing. [4]
c) Write on detection of deletion mutations. [2]
- Q5)** a) Discuss on genome size & evolutionary complexity. [5]
b) Explain transposition behaviour of Ac & Ds elements in maize. [5]

P.T.O.

- Q6)** a) Describe the process of infection, their stages & regulation of T₄ bacteriophages. [5]
b) Discuss on conjugal functions & pilus production of bacteria. [5]
- Q7)** a) Give the structure & evolution of low molecular weight subunits of gliadin genes. [5]
b) Explain allele frequency calculation method. [5]
- Q8)** a) Write the mechanism of double site. specific recombinations. [5]
b) Describe indirect diagnosis of inherited diseases with linked genetic markers. [5]



Total No. of Questions : 8]

SEAT No. :

P1651

[5129]-308

[Total No. of Pages : 2

M.Sc.-II

BOTANY

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

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 wherever necessary.*

- Q1)** a) Explain the technique of “DNA Microarray”. [4]
b) Describe different methods of PCR. [4]
c) Write any two strategies to obtain virus resistant plants. [2]
- Q2)** a) Mention use of restriction endonucleases in recombinant DNA technology? [4]
b) What is reverse hybridization? Write its use. [4]
c) Differentiate between biotic & abiotic elicitors with examples. [2]
- Q3)** a) Discuss about pathway engineering. Mention successful examples. [4]
b) Comment on selection of recombinant phage vectors. [4]
c) Enlist the genes to obtain insect resistance. [2]
- Q4)** a) Write the steps in antisense technology of gene silencing. [4]
b) Explain working of “Gene Synthesis Machine”. [4]
c) What are promoter & enhancer traps? [2]

P.T.O.

- Q5)** a) Discuss the steps in construction & Screening of DNA libraries. [5]
b) Explain “Site Directed Mutagenesis”. [5]
- Q6)** a) Give an account of chromosome walking & jumping. [5]
b) What are different approaches for obtaining drought resistant transgenics. [5]
- Q7)** a) Write an account of “Transgenics for fungal resistance”. [5]
b) Describe the types of culture systems for secondary metabolite production. [5]
- Q8)** a) Give the concept of cosuppression in gene silencing. [5]
b) Explain technique of screening & selection of high secondary metabolite producing cell lines. [5]



Total No. of Questions : 8]

SEAT No. :

P1652

[5129]-309

[Total No. of Pages : 2

M.Sc. - II

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 diagram must be drawn whenever necessary.*

- Q1)** a) Comment on Indian trade in oromatic plants. [4]
b) Describe Biogenesis of Phytopharmaceuticals. [4]
c) What is drug evaluation. [2]
- Q2)** a) Give on accounts of natural excipients. [4]
b) Discuss applications of eucalyptus. [4]
c) What is Immunomodulatory. [2]
- Q3)** a) Describe cultivation method of Tabacco. [4]
b) Give ayurvedic profile of punarnava. [4]
c) What is phytopharmoceuticals. [2]
- Q4)** a) Explain biosynthesis of alkaloids. [4]
b) Comment on Biological method of drug evaluation. [4]
c) Give application of Honey. [2]
- Q5)** a) Write source, Cultivation and application of Arjuna. [5]
b) Discuss principle and formulation of Hirda. [5]

P.T.O.

- Q6)** a) Comment on Ayurvedic medicinal products industries in India. [5]
b) Explain Biosynthesis of glycosides. [5]
- Q7)** a) Discuss principle and formulation of guggal. [5]
b) What are application of garlic and Indian senna [5]
- Q8)** a) Give classification of crude drug. [5]
b) Write source, cultivation and application of Aloes. [5]



Total No. of Questions : 8]

SEAT No. :

P1653

[5129]-311

[Total No. of Pages : 2

M.Sc. - II

BOTANY

**BO - 3.48 : Advanced Seed Technology
(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 diagrams wherever necessary.*
- 4) *Figures to the right indicate full marks.*

- Q1)** a) Comment on important seed industries in India. [4]
b) Describe structure of mega sporangium [4]
c) What are certified seeds? [2]
- Q2)** a) Discuss on seed village concept. [4]
b) Give an account of air screen cleaner. [4]
c) Write on seed dormancy. [2]
- Q3)** a) Comment of grow out test. [4]
b) Explain artificial seed production. [4]
c) What is seed storage? [2]
- Q4)** a) Comment on central seed committee. [4]
b) Discuss inspection with reference to stage of crop. [4]
c) What are offtypes? [2]
- Q5)** a) Describe types of seed germination. [5]
b) Comment on seed health testing methods. [5]

P.T.O.

- Q6)** a) Give constructional features for good seed warehouse. [5]
b) Explain types of dormancy. [5]
- Q7)** a) Write on chemical composition of seed. [5]
b) Discuss impact of seed infection on seed. [5]
- Q8)** a) Comment on gametocides. [5]
b) Write note on cold storage of seed. [5]



Total No. of Questions : 8]

SEAT No. :

P1654

[5129]-312

[Total No. of Pages : 2

M.Sc. - II

BOTANY

BO - 3.50 : Advanced Biodiversity

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

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

- Q1)** a) Explain Angiosperm diversity at taxonomic level w.r.t species habit, habitat and distribution. [4]
b) Describe nature and origin of genetic variations. [4]
c) Comment on scope and importance of biodiversity. [2]
- Q2)** a) Write on bryophyte diversity w.r.t species, habit & habitat. [4]
b) State species inventory and origin of species diversity. [4]
c) Write in brief about classification of ecosystems. [2]
- Q3)** a) Comment on RFLP and RAPD. [4]
b) Explain alpha and gamma diversity. [4]
c) Write on lichen diversity. [2]
- Q4)** a) Comment on current states of Plant diversity. [4]
b) Discuss population size as a critical factor in species. Extinction and population viability analysis related to loss of species diversity. [4]
c) What are sacred groves? [2]
- Q5)** a) Describe global distribution of biodiversity. [5]
b) Comment on endemic biodiversity. [5]

P.T.O.

- Q6)** a) Explain any two methods of ex-situ conservation [5]
b) Write on ecosystem restoration. [5]
- Q7)** a) Explain the role of biodiversity in medicine [5]
b) Give the common features of threatened species [5]
- Q8)** a) Comment on direct adverse impact of biotechnology on biodiversity. [5]
b) Write on Biodiversity of India. [5]



Total No. of Questions : 8]

SEAT No. :

P1655

[5129]-401

[Total No. of Pages :2

M.Sc.-II

BOTANY

**BO- 4.1 : Computational Botany
(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 where necessary.*

- Q1) a) Calculate Mean, Mode and Median from the given data.
example: Weights of 15 onion bulbs in grams are given below
34, 35, 32, 31, 34, 32, 37, 34, 38, 33, 34, 33, 35, 37, 31 [4]
- b) Comment on principles of experimental design. [4]
- c) What are radioisotopes? [2]
- Q2) a) Give the difference between parametric and non-parametric tests. [4]
- b) Distinguish between primary and secondary database. [4]
- c) What is Molar solution? [2]
- Q3) a) Explain Mann-Whitney U-test. [4]
- b) Discuss similarity based database searching. [4]
- c) Give applications of haemocytometry. [2]
- Q4) a) How many grams of solid NaOH are required to prepare 700ml of 0.2M solution? Express the concentration of solution in terms of percent(w/v) [4]
- b) What is correlation? Describe the various types of correlation. [4]
- c) Comment on EMBEL. [2]

P.T.O.

- Q5)** a) The weight of Lemon fruits harvested from two trees are given below. Calculate the mean weights of the fruits from each tree and test whether the difference in weight is significant or not by t-test. [5]

wt.of fruits in grams	Tree1	35	39	33	37	38	30	31	36	39	32
	TreeII	30	35	32	28	30	31	25	32	28	29

- b) Describe completely Randomized design (CDR). Give its applications. [5]
- Q6)** a) Comment on Tutey's test for pair wise comparison of treatments. [5]
b) Discuss the role of FASTA & BLAST. [5]
- Q7)** a) What is sampling? Describe methods of sampling [5]
b) Explain one way classification technique of ANOVA. [5]
- Q8)** a) Write on Kurtosis. Give an account of different kinds of kurtosis. [5]
b) What is Bioinformatics? Give its applications. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P1656

[5129] - 402

M.Sc.

BOTANY

**BO-4.2: Plant - Organism Interaction
(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 diagram must be drawn wherever necessary.*

- Q1)** a) Explain Competitive mechanisms in plants. [4]
b) Comment on grazing animals - plant interactions. [4]
c) What is allelopathy? [2]
- Q2)** a) Write morphological features and biochemical interactions in carnivorous plants. [4]
b) Give an account of plant signalling and defense against herbivores. [4]
c) Enlist any two examples of mimicry. [2]
- Q3)** a) Comment on epiphytic plants. [4]
b) Explain two parasitic associations in plants. [4]
c) Briefly write on thermogenesis. [2]
- Q4)** a) Comment on humming-bird-plant interactions. [4]
b) Write on special structures in lichen thalli. [4]
c) Distinguish ectomycorrhizae from endomycorrhizae. [2]

P.T.O.

- Q5)** a) Explain ectendrophic mycorrhizae. [5]
b) Comment an endophytic fungi. [5]
- Q6)** a) Discuss algae - coral relationship. [5]
b) Explain rhizobium plant interactions. [5]
- Q7)** a) Discuss beettes and bees are important pollinators. [5]
b) Write briefly on insect-fungi interactions. [5]
- Q8)** a) How seed morphology has relevance to dispersal mechanism? [5]
b) How flowers have modified for cross pollination? [5]

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Total No. of Questions : 8]

SEAT No. :

P1657

[5129]-403

[Total No. of Pages : 2

M.Sc.

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) *Neat labelled diagram must be drawn wherever necessary.*

Q1) a) Give an account of contribution of fruits to GDP. **[4]**

b) Describe the factors affecting flower production. **[4]**

c) Mention the substrates used in hardening. **[2]**

Q2) a) Give the details of micropropagation of sugarcane. **[4]**

b) Comment on any four medicinal plants mentioned in Atharvaveda with their applications. **[4]**

c) Enlist the conventional methods for fruits preservation. **[2]**

Q3) a) Comment on laboratory design for plant tissue culture. **[4]**

b) Discuss biotechnological approaches for improving post-harvestlife of fruits. **[4]**

c) What is phyto-technology? **[2]**

Q4) a) Write a note on natural dyes used for cotton industry. **[4]**

b) Give the principles of garden designing. **[4]**

c) What is indoor gardening? **[2]**

P.T.O.

- Q5)** a) Give an importance & scope of floriculture. Add a note on cultivation of carnation. [5]
b) Write on medicinal herbs used in cosmetics. [5]
- Q6)** a) Discuss the biological factors affecting deterioration of fruits. [5]
b) Give an account of techno-commercial report of micropropagation of Banana. [5]
- Q7)** a) Write on value addition to biodiversity through chemo prospection. [5]
b) Briefly write on various styles of gardening. [5]
- Q8)** a) Comment on In - vitro rooting & acclimatization of tissue culture raised Lilium plantlets. [5]
b) Give an account of harvesting & processing of fruits. [5]

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Total No. of Questions : 8]

SEAT No. :

P1658

[5129]-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) *Draw neat labelled diagrams wherever necessary.*
- 3) *All questions carry equal marks.*
- 4) *Figures to right indicate full marks.*

Q1) a) What is epidemiology? Give an account on disease forecasting. **[4]**

b) What are the effects of pathogen on Physiology of host. **[4]**

c) Give any two differences between horizontal and vertical resistance. **[2]**

Q2) a) Comment on hypersensitive defense reaction in plants. **[4]**

b) Give an account of any one viral diseases in plants. **[4]**

c) Comment on effects of plant diseases on human affairs. **[2]**

Q3) a) Discuss briefly the genetics of host pathogen interactions. **[4]**

b) Write about any two agents of active dispersal of plant pathogens. **[4]**

c) Mention any two effects of light on disease development. **[2]**

Q4) a) Give an account on the chemical control of plant diseases. **[4]**

b) Write the concept and objectives of plant disease. **[4]**

c) Give the correct meaning infection. **[2]**

P.T.O.

- Q5)** a) Give an account of any two diseases caused by mollicutes. [5]
b) Describe any two methods for assessment of plant disease. [5]
- Q6)** a) Write about any two diagnostic methods for detecting plant pathogens. [5]
b) Write about the molecular biology of host-pathogen interactions. [5]
- Q7)** a) Comment on the biological control of plant diseases. [5]
b) Discuss the role of temperature and soil pH in disease development. [5]
- Q8)** a) What are symptoms? Describe any four symptoms of plant diseases. [5]
b) Explain the role of biotechnology in plant pathology. [5]

