

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3236

[5032] - 101

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

Q1) a) Give affinities of Bryophytes with pteridophytes. [4]

b) Comment on Economic importance of Bryophytes. [4]

c) Mention classification of Bryophyta upto family level according to G.M.Smith. [2]

Q2) a) Write in brief reduction theory of sporophyte evolution in Bryophytes.[4]

b) Describe morphogenesis and culture of Bryophytes in brief. [4]

c) Comment on Fossil Bryophytes. [2]

Q3) a) Describe morphology of Gametophyte of sphaerocarpaceae. [4]

b) Explain sporophyte in Calobryales. [4]

c) Write distinguishing Characters of Marchantiales. [2]

P.T.O.

- Q4)** a) Describe morphology and anatomy of gametophyte in Anthocerotates. [4]
b) Write morphology and anatomy as Sporophyte of Andreales. [4]
c) Comment on distribution of funariales. [2]
- Q5)** a) Explain Apoqamy and Apospory in pteridophytes. [5]
b) Comment on Indian pteridology. [5]
- Q6)** a) Write a note on Lepidodendron. [5]
b) Explain Cheirostrobos. [5]
- Q7)** a) Write distinguishing characters and distribution of psilopsida. [5]
b) Describe morphology of Isoetales. [5]
- Q8)** a) Give distinguishing characters of filicales and Ophioglossales. [5]
b) Describe spore producing organ in Equisetales. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P3237

[5032]-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 diagram wherever necessary.*

- Q1)** a) Describe Calvin Cycle. [4]
b) Write on Allosteric enzyme. [4]
c) What is biological clock? [2]
- Q2)** a) Give an account of pentose phosphate pathway. [4]
b) Comment on Glycolipids. [4]
c) Explain Redox potential. [2]
- Q3)** a) Discuss the process of 'Glucogenesis'. [4]
b) Comment on 'RUBISCO' activity. [4]
c) What are the pyrimedines? [2]
- Q4)** a) Explain photoinhibition of O₂ and H₂ evolution. [4]
b) Comment on biosynthesis of flavonoids. [4]
c) State 'Nernst and goldmen equation'. [2]

P.T.O.

- Q5)** a) Write general classification of Amino acid. [5]
b) State metabolic changes occurs during fruit ripening. [5]
- Q6)** a) State principle, working and applications of Infrared pyrometer. [5]
b) Write mechanism of root nodulation and nitrogen fixation. [5]
- Q7)** a) Explain ATP driven active transport system. [5]
b) Write general classification of steroids. [5]
- Q8)** a) Discuss the process of lipid biosynthesis and oxidation. [5]
b) Write on biosynthesis of abscisic acid. [5]



Total No. of Questions : 8]

SEAT No. :

P3238

[5032] - 103

[Total No. of Pages :2

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

- Q1)** a) Explain chloroplast inheritance in mieabilis jalapa. [4]
b) Give characteristic feature of multiple alleles. [4]
c) State law of Independent assortment. [2]
- Q2)** a) Give an account centres of origin of plant genetic resources. [4]
b) Explain the mechanism of transformation. [4]
c) Write on germinal and somatic mutation. [2]
- Q3)** a) Discuss the inheritance of coblength in zea mays. [4]
b) Comment on linkage mapping. [4]
c) Give objectives of plant breeding.. [2]
- Q4)** a) Explain pollination control mechanism in self pullinated crop. [4]
b) Write applications of polyploidy. [4]
c) What are complex traits? [2]
- Q5)** a) Give an account of factors affecting H.W. equillibrium. [5]
b) Describe mass selection methods in self pollinated crops. [5]

P.T.O

- Q6)** a) What are autopolyploids? [5]
b) Write principles of combination breeding and its applications. [5]
- Q7)** a) Comment on chromosome banding and its application. [5]
b) Give an account of X²-test and its applications. [5]
- Q8)** a) Describe conjugation in Bacteria. [5]
b) Give an account of different types of mutations. [5]

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Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3239

[5032]-104

M.Sc.

BOTANY -I

BO-1.4: Botanical Techniques

(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 whenever necessary.*

- Q1)** a) Describe phase contrast microscopy. [4]
b) Briefly write on TEM. [4]
c) What is squash? [2]
- Q2)** a) Give brief account of TLC. [4]
b) Explain SDS - PAGE. [4]
c) Write note on cytochemical techniques. [2]
- Q3)** a) What is microtomy? Write note on its applications. [4]
b) Comment of fluroscent microscopy. [4]
c) Write note on concept of magnification. [2]
- Q4)** a) Describe X-ray crystallography. [4]
b) Give principles and applications of gas chromatography. [4]
c) State Beer and Lambert's law. [2]

P.T.O.

- Q5)** a) Comment on Gel filtration and affinity chromatography. [5]
b) Give an account of radioisotopes used in biology with their properties. [5]
- Q6)** a) Discuss technique of Density Gradient centrifugation. [5]
b) Give an account Rocket immunoelectrophoresis. [5]
- Q7)** a) Write an maxam Gilbert's methods. [5]
b) Briefly write on pH meter. [5]
- Q8)** a) Comment on column chromatography. [5]
b) Comment on micrometry and camera lucida. [5]

EEE

Total No. of Questions :8]

SEAT No. :

P3240

[5032]-201

[Total No. of Pages :2

M.Sc.-I

BOTANY

BO - 2.1: Cryptogamic Botany-II

(2013 Pattern) (Semester - II)(Credit System)(Algae & Fungi)

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 note on thallus structure in chlorophyta. [4]
b) Give Ainsworth's system of classification of fungi [4]
c) Mention any four characters of fungi [2]
- Q2)** a) Comment on heterothallism in Zygomycotina. [4]
b) Write on structure and reproduction in nosto cales [4]
c) Write briefly on fossil algae [2]
- Q3)** a) What are the sources of data for plant systematics. [4]
b) Give concept of hamathecium. [4]
c) Write on cell structure in fungi [2]
- Q4)** a) Give an account of thallus structure in myxomycotina [4]
b) Comment on pigment constitution in algae [4]
c) Differentiate between systematics and taxonomy. [2]

P.T.O.

- Q5)** a) What are lichens? Comment on nature and association. [5]
b) What is charophyta? Comment on its reproduction. [5]
- Q6)** a) Comment on fructification in Ascomycetes. [5]
b) Give distinguishing characters of Deuteromycotina. Add a note on conidial ontogeny. [5]
- Q7)** a) Give distinguishing characters of phaeophyta. [5]
b) What is mycorrhiza? Give its importance in agriculture. [5]
- Q8)** a) Discuss types and structure of basidia and basidiospores [5]
b) Give an account of mycotoxins. [5]



Total No. of Questions : 8]

SEAT No. :

P 3241

[5032] - 202

[Total No. of Pages :2

M. Sc. - I

BOTANY

**BO - 2.2: Cell Biology and Evolution
(2013 Pattern) (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) Explain fluid mosaic model of plasma membrane. [4]
b) Give functions of endoplasmic reticulum. [4]
c) What is population genetics? [2]
- Q2)** a) Comment on evolution of unicellular eukaryotes. [4]
b) Give ultrastructure of lysosomes. [4]
c) What is gene frequency? [2]
- Q3)** a) Define Apoptosis. Explain its mechanism. [4]
b) Explain different phases of cell cycle. [4]
c) Give functions of flagella. [2]
- Q4)** a) Explain stomatal guard signalling. [4]
b) Write a note on. molecular aspects of cell death. [4]
c) Enlist any two types, of speciation. [2]

P.T.O

- Q5)** a) Explain ultra - structure of Golgi - Complex. [5]
b) Write a note on - Maturation promoting factor (MPF). [5]
- Q6)** a) Explain signal transduction. [5]
b) Write on co - evolution. [5]
- Q7)** a) Write briefly on RNA world hypothesis. [5]
b) Explain cell aging and cell senescence. [5]
- Q8)** a) Write on, natural selection. [5]
b) State the difference between biotic and abiotic stress. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages :2

P3242

[5032]-203

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 labelled diagram must be drawn wherever necessary.*

- Q1)** a) Explain mechanism of prokaryotic DNA replications. [4]
b) Describe dissociation and reassociation kinetics of DNA. [4]
c) Write on excision repair mechanism. [2]
- Q2)** a) Write on transcription apparatus in eukaryotes. [4]
b) Explain mechanism of positive and negative regulation of prokaryotic genes. [4]
c) What are exons? [2]
- Q3)** a) Give role of polymerase & ligase enzymes in genetic engineering. [4]
b) What is C-value paradox? [4]
c) Write screening methods for recombinants in phases. [2]
- Q4)** a) Write an C-DNA library. [4]
b) Write methods to handle transformants. [4]
c) Explain Western blotting. [2]

P.T.O.

- Q5)** a) Discuss the mechanism of protein synthesis in prokaryotes. [5]
b) Enlist gene transfer methods in plants? Discuss any two methods in detail. [5]
- Q6)** a) Write a note on plasmids & vectors for marker free selection. [5]
b) Explain physical and chemical properties of DNA. [5]
- Q7)** a) Explain the mechanism of RNA processing in eukaryotes. [5]
b) Explain gene transfer for the production of useful products. [5]
- Q8)** a) Discuss lignin modification in plants by genetic engineering. [5]
b) Write in detail on DNA polymerases. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3243

[5032] - 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) *Neat labelled diagram must be drawn wherever necessary.*

- Q1)** a) Comment on plant relation with respect to type of soil and water holding capacity of the soil. [4]
b) Explain C - S - R triangle. [4]
c) What is xerasere [2]
- Q2)** a) Give components of Tundra and Desert bionics. [4]
b) Write the impact of soil and noise pollution on Environment. [4]
c) Comment on community structure. [2]
- Q3)** a) Comment on carbon sequestration. [4]
b) Explain Endemism. [4]
c) Give the impact of water pollution on marine life. [2]
- Q4)** a) Comment on factors affecting population size. [4]
b) Explain autogenic and allogenic succession. [4]
c) Enlist floristic regions of India. [2]

P.T.O.

- Q5)** a) Discuss plant relation with respect to light and radiation. [5]
b) Explain adaptive responses of plant to variation in water availability. [5]
- Q6)** a) Write a note on population viability analysis. [5]
b) Comment on fresh water ecosystem. [5]
- Q7)** a) Comment on Estuarine Ecology. [5]
b) Describe Ecotone and Edge Effect. [5]
- Q8)** a) Explain plant distribution with respect to topographic and climatic factors. [5]
b) Describe major plant communities of the world. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3244

[5032] - 301

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) Write general character's of Pentoxylales. [4]

b) Give classification of Gymnosperms as per sporne (1965). [4]

c) Caytonia. [2]

Q2) a) Explain salient features of Ginkgoales. [4]

b) Write affinities of Gnetales with Angiosperms. [4]

c) Give economic importance of Gymnosperms. [2]

Q3) a) How taxonomy is synthetic discipline? [4]

b) Briefly write on Angiosperm phylogeny group (APG). [4]

c) Comment on alpha and omega taxonomy. [2]

P.T.O.

- Q4)** a) Give economic importance of Piperaceae. [4]
b) Write systematic position and phylogeny of Alismataceae. [4]
c) Explain phenetic verses phylogenetic system. [2]
- Q5)** a) Describe male and female cones in Coniferales. [5]
b) Give character's of Gymnosperm's and add a note on its distribution in world. [5]
- Q6)** a) Comment on pteridospermales and Glossopteris. [5]
b) Give characters of Cordaitales and comment on cordaitanthus. [5]
- Q7)** a) Comment on invasions and introduction. [5]
b) Give merits and demerits of cronquist system of classification. [5]
- Q8)** a) Discuss phylogeny and economic importance of Magnoliaceae. [5]
b) Write on salient features-principles of ICBN. [5]



Total No. of Questions : 8]

SEAT No. :

P3245

[5032]-302

[Total No. of Pages :2

M.Sc.

BOTANY

**Bo-3.2 : Developmental Biology and Economic Botany
(2013 Pattern) (Semester - III) (New) (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 wherever necessary.*

- Q1)** a) Explain molecular mechanism of Cell-cell interaction. [4]
b) Give an account of how polarity and symmetry maintain during development. [4]
c) What is concept of 'Determination'. [2]
- Q2)** a) Write an account of embryo development in monocot. [4]
b) Discuss developmental mechanism of 'Megasporogenesis'. [4]
c) State significance of double fertilization. [2]
- Q3)** a) Explain molecular aspect of embryogenesis and seedling development. [4]
b) Write note on SAM. [4]
c) What is 'Redifferentiation. [2]
- Q4)** a) State the method of cultivation of Rubber. Add note on its products. [4]
b) Comment on fibre industry. [4]
c) State different varieties of strawberry. [2]

P.T.O.

- Q5)** a) Discuss in detail about the meristem as dynamic center of cell regeneration. [5]
b) Give an account of seed germination. [5]
- Q6)** a) What is double fertilization? Write note on abnormalities in fertilization. [5]
b) Comment on cell differentiation, redifferentiation and dedifferentiation. [5]
- Q7)** a) What is polyembryony? Describe its classes. [5]
b) Write economic importance of deodar and sandal wood. [5]
- Q8)** a) Describe the method of cultivation of cinnamon. Add note on its economic importance. [5]
b) Discuss the role of organ culture in understanding the developmental process. [5]



Total No. of Questions : 8]

SEAT No. :

P3246

[5032] - 303

[Total No. of Pages :2

M.Sc.-II

BOTANY

BO-3.3 : Industrial Botany-I

(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) What are biofuels? Write a note on environmental implications of fossil fuels. [4]
- b) Comment on oil refining process from micro algae. [4]
- c) Write on bio-pesticides and Give its significance [2]
- Q2)** a) Add a note on commercial utility of algae as a food and pigments. [4]
- b) Describe the method of bioethanol production from sugar. [4]
- c) Write any one method of oil extraction. [2]
- Q3)** a) Comment on Bacillus thuringiensis as a biopesticide. [4]
- b) Give the difference between entrepreneur and a manager. [4]
- c) Write sources of penicillin and cephalosporins. [2]
- Q4)** a) Explain characteristics and functions of entrepreneur. [4]
- b) Give role of bio-hydrogen in bio-fuel [4]
- c) What is SCP? Write any two applications of SCP. [2]
- Q5)** a) Comment on down-stream process. [5]
- b) Enlist the commercial banks and explain any one as finance to entrepreneurs. [5]

P.T.O

- Q6)** a) Give the difference between management and administration. [5]
b) Discuss the sources and method of citric acid production. [5]
- Q7)** a) Describe the method of paddy straw mushroom production. [5]
b) Write on standardization of bio-ethanol. [5]
- Q8)** a) Comment on mass cultivation method of Spiralling [5]
b) Discuss method of alcohol production [5]

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Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3247

[5032]-304

M.Sc. -II

BOTANY

**BO-3.41: Advanced Mycology and Plant Pathology
(2013 Pattern) (Special) (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) How fungi are model organisms for genetical studies? [4]
b) Write on Acrasiomycetes. [4]
c) What are Trichomycetes. [2]
- Q2)** a) Write on fungal cell structure. [4]
b) Comment on sexual spores in fungi. [4]
c) Briefly write on Auriculariales. [2]
- Q3)** a) Comment on Net slime moulds. [4]
b) Give contributions of any two mycologists. [4]
c) Write on Dacrymycetales. [2]
- Q4)** a) State molecular aspects of fungal taxonomy. [4]
b) Distinguish between rusts and smuts. [4]
c) What are types of plasmodia in myxomycetes. [2]

P.T.O.

- Q5)** a) Write Webster and Webers system of classification of fungi. [5]
b) Comment on Oomycota. [5]
- Q6)** a) Write plant-fungal symbiotic association. [5]
b) Explain different aspects of Tinea. [5]
- Q7)** a) Write on fruit bodies in Gasteromycetes. [5]
b) Comment on powdery mildew fungi. [5]
- Q8)** a) Discuss colonization strategies among fungi. [5]
b) Explain spore fruit bodies in Deuteromycota. [5]

EEE

Total No. of Questions : 8]

SEAT No. :

P3248

[5032]-305

[Total No. of Pages : 2

M.Sc.

BOTANY

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

- Q1)** a) Give salient features of Passifloraceae. Describe floral variations of it. [4]
b) What are plastids? Describe their role in classification of higher taxa. [4]
c) Write briefly on systematic position of Ranunculaceae. [2]
- Q2)** a) Describe the role of serology in taxonomy. Give applications of serological data in systematics. [4]
b) Explain the stages in chemotaxonomic investigations. [4]
c) Describe meiotic analysis in detail and its role in plant systematics. [2]
- Q3)** a) What is Taxometrics? Describe principles of it and add a note on construction of taxonomic groups. [4]
b) Enlist pollen characters of taxonomic importance. Give systematic position of parietales with special reference to pollen characters. [4]
c) Write briefly on vasculature in flower. [2]
- Q4)** a) Justify the taxonomy of sub families Ioranthoideae and viscoideae. [4]
b) Discuss the role of evolution of angiosperms in solving taxonomic problems. [4]
c) Write briefly on palynogram. [2]

P.T.O.

- Q5)** a) Describe pollen morphology with special reference to polarity and symmetry. Add note on exine stratification. [5]
b) Describe in detail phytogeographical regions of the world. [5]
- Q6)** a) Define cytotaxonomy. Describe in detail its scope and limitations. [5]
b) Describe the role of proteins in taxonomy. Add a note on techniques of protein electrophoresis. [5]
- Q7)** a) Describe the role of molecular data in systematics. Add a note on systematic position of Hydatellaceae. [5]
b) Give salient features of family Bignoniaceae. Describe floral variations in it. [5]
- Q8)** a) What is cladistics? Describe its role in classification. [5]
b) Discuss systematic position of paeonia and Trapa. [5]

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Total No. of Questions :8]

SEAT No. :

P3249

[5032]-306

[Total No. of Pages :2

M.Sc. - II

BOTANY

BO-3.43: Advanced Plant Physiology

(2013 Pattern) (Semester - III)

Time :3 Hours]

[Max. Marks :50

Instructions to the candidates:

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

Q1) a) What are secondary metabolites? Add a note on its role in plant. [4]

b) Explain the role played synthetic PGR in plants. [4]

c) Give an account on water channels. [2]

Q2) a) Write a note on water conservation strategies used by plant. [4]

b) What are the applications of natural PGRs studied by you (any one).[4]

c) What is the significance of CAM Pathway? [2]

Q3) a) Mention the theories of phloens transport. [4]

b) Define the stress. Give an account an physiological mechanism developed by plant to tolerate salt stress. [4]

c) What are the examples of C₃ & C₄ plants? [2]

Q4) a) Explain about partitioning of photosynthetic assimilates. [4]

b) Write biosynthesis of IAA. [4]

c) What are the types of soils. [2]

P.T.O.

- Q5)** a) Write about CAM pathway in aquatic plants. [5]
b) Give an account of vernalization. [5]
- Q6)** a) Give an account of evolution of PEP case & RUBISCO. [5]
b) Explain about diverse nature of mitochondrial ETS. [5]
- Q7)** a) Explain about CO₂ compensation point. [5]
b) What is the significance of overall regulation of respiration. [5]
- Q8)** a) Write a note on circadian rhythms. [5]
b) What is significance of cyanide resistance respiration. [5]

EEE

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3250

[5032]-307

M.Sc. - II

BOTANY

**BO-344: Advanced Genetics & Molecular Biology
(2013 Pattern) (New) (Credit System) (Semester - III)**

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 diagrams wherever necessary.*

Q1) a) Explain process of DNA replication in plasmids. **[4]**

b) Describe structure of R II locus in T₄ bacteriophage. **[4]**

c) Comment on morphogenesis and maturation. **[2]**

Q2) a) Describe in brief prokaryotic chromosome. **[4]**

b) Give the characteristic of transposition and explain its mechanism. **[4]**

c) Comment on polytene chromosome. **[2]**

Q3) a) Write on wheat gluten proteins. Give their classification, nomenclature and isolation method. **[4]**

b) Describe hardy-Weinberg principle and their implications. **[4]**

c) Comment on DNA polymorphism. **[2]**

Q4) a) Explain the mechanism of double site specific recombination in phage. **[4]**

b) Write note on VNTRS. **[4]**

c) Comment on Integrons. **[2]**

P.T.O.

- Q5)** a) Write on molecular structure of centromere and telomere in Eukaryote. **[5]**
- b) Discuss initial stage of infection and regulation of infection in bacteriophage. **[5]**
- Q6)** a) Write on structure and evolution of high molecular weight subunit genes. **[5]**
- b) Give an account of circular chromosome segregations. **[5]**
- Q7)** a) Write on Genome size and evolutionary complexity. **[5]**
- b) Explain mechanism of pilus production. **[5]**
- Q8)** a) Write note on radiation hybrid maps. **[5]**
- b) Comment on nucleotide sequence. **[5]**

EEE

Total No. of Questions :8]

SEAT No. :

P3251

[5032]-308

[Total No. of Pages :2

M.Sc.

BOTANY

BO-3.45: Advanced Plant Biotechnology

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

Time :3 Hours]

[Max. Marks :50

Instructions to the candidates:

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

- Q1)** a) Give applications of molecular markers in Biotechnology. [4]
- b) Explain technique of differential screening and subtractive hybridization to study gene expression. [4]
- c) Write working of any one type of bioreactor. [2]
- Q2)** a) Describe the methods of PCR and add a note on applications of PCR.[4]
- b) Give the strategies to obtain insect resistant transgenic plants. [4]
- c) Enlist applications of DNA libraries. [2]
- Q3)** a) Discuss any two approaches for obtaining transgenic plants for glyphosate resistance. [4]
- b) Differentiate between Northern and reverse Northern hybridization. [4]
- c) Write use of elicitors for improving secondary metabolite production.[2]

P.T.O.

- Q4)** a) Explain two vectors and their use in gene cloning. [4]
b) Describe strategies to obtain virus resistant plants. [4]
c) Write a note on antisense technology. [2]
- Q5)** a) Comment on any one mechanism of gene silencing. [5]
b) Discuss different types of tissue culture systems used for secondary metabolite production. [5]
- Q6)** a) Give strategies to obtain nematode resistant transgenic plants. [5]
b) Describe mechanisms of gene tagging and plasmid rescue. [5]
- Q7)** a) State applications of Bt gene in transgenic insect resistant plants. [5]
b) Explain chromosome walking and jumping. [5]
- Q8)** a) Discuss various applications of in vitro secondary metabolite production. [5]
b) Comment on Northern hybridization technique. [5]

EEE

Total No. of Questions :8]

SEAT No. :

P3252

[5032]-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 medicinal plant in India. [4]
b) Comment on morphological and microscopical methods of drug evaluation. [4]
c) What is crude drug. [2]
- Q2)** a) Write a note on biogenesis of phytopharmaceuticals. [4]
b) Comment on Ayurvedic system of medicine. [4]
c) Define: Drug Adulteration. [2]
- Q3)** a) Write source, cultivation, collection, macroscopic characters and application of papermint. [4]
b) Comment on Natural excipients. [4]
c) What is pharmacognosy. [2]
- Q4)** a) Explain marine drugs. [4]
b) Write Ayurvedic profile of Guggul. [4]
c) What are Natural pesticides? [2]

P.T.O.

- Q5)** a) Enlist classification of crude drugs. Give detail account of any two. [5]
b) Write source, cultivation collection, macroscopic characters and application of Liquorice. [5]
- Q6)** a) Comment on pyrethrum as 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 Indian Senna. [5]
- Q8)** a) Discuss the principle, formulation and Ayurvedic profile of Behra drug.[5]
b) Write a case study of any one Ayurvedic medicinal product in India?[5]

EEE

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3253

[5032]-311

M.Sc. -II

BOTANY

BO-3.48: Advanced Seed Technology

(2013 Pattern) (Special) (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 whenever necessary.*

- Q1)** a) Comment on important seed industries in India. [4]
b) Explain structure of microsporangium. [4]
c) Define autogamy. [2]
- Q2)** a) Write classes of seeds. [4]
b) Give general layout of seed processing plants. [4]
c) What are foundation seeds? [2]
- Q3)** a) Comment on physical purity analysis. [4]
b) Give an account of seed legislation in India. [4]
c) What are artificial seeds? [2]
- Q4)** a) Explain seed village concept. [4]
b) Give an account of seed health testing methods. [4]
c) Define seed vigour. [2]

P.T.O.

- Q5)** a) Give an account of causes of seed dormancy. [5]
b) Comment on general principles of seed production. [5]
- Q6)** a) Describe chemical composition of seed. [5]
b) Comment on slurry treater. [5]
- Q7)** a) Give objectives of seed testing. [5]
b) Comment on seed store grain pests. [5]
- Q8)** a) Write seed inspector powers and duties. [5]
b) Discuss method of cold storage of seeds. [5]

EEE

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3254

[5032]-312

M.Sc. -II

BOTANY

BO-3.50: Advanced Biodiversity

(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 Angiosperm diversity with reference to species habit and habitat. [4]
- b) Explain in brief Grassland and Tropical Forest Ecosystem. [4]
- c) What is RFLP? [2]
- Q2)** a) Describe pteridophyte diversity with reference to habitat and distribution. [4]
- b) Explain alpha and beta diversity. [4]
- c) Comment on scope and importance of biodiversity. [2]
- Q3)** a) Write on Endemism and biodiversity giving examples. [4]
- b) Comment on different sampling techniques for monitoring of plant and insect diversity. [4]
- c) What are the common features of threatened species. [2]
- Q4)** a) Discuss Biodiversity of India. [4]
- b) Explain factors affecting ecosystem degradation and loss. [4]
- c) Comment on diversity indices based on species richness. [2]

P.T.O.

- Q5)** a) Describe any two in-situ conservation methods. [5]
b) Explain in brief on sacred groves and sthalavrikshas. [5]
- Q6)** a) Write on field gene banks and seed banks. [5]
b) Explain people's movement for Biodiversity conservation. [5]
- Q7)** a) Comment on estimates and examples of recently discovered communities. [5]
b) Write adverse impact of biotechnology on biodiversity. [5]
- Q8)** a) Describe ethical and aesthetic values of biodiversity. [5]
b) Explain global distribution of biodiversity and number of species world wide. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3255

[5032]-401

M.Sc.-II

BOTANY

BO - 4.1: Computational Botany

(2013 Pattern) (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) The height and yield of 7 plants are given below find the Karl Pearson's coefficient between the two variables. **[4]**

Hight of plants(cm)	11.7	13.9	15.5	17.8	18.5	19.2	21
yield (gm)	7.10	12.42	15.35	23.20	28.45	32.25	39.84

- b) Give the properties of Normal distribution curve. **[4]**
- c) Write principle of spectrophotometer **[2]**

Q2) a) Describe Randomized block design(RBD). Give its applications. **[4]**

- b) Explain Nearst and Goldmen equations. **[4]**
- c) Comment on FASTA. **[2]**

Q3) a) What is Duncaris multiple range test? **[4]**

- b) Comment on Bioinformatics databases. **[4]**
- c) Enlist the properties of 'Mode' **[2]**

P.T.O.

- Q4)** a) What do you mean by dispersion? Describe different types of dispersion [4]
b) How much volume is required to prepare 100 ml solution of 100 mm NaCl from IM stock solution. [4]
c) Comment on statistical hypothesis. [2]
- Q5)** a) In monohybrid cross between tall and dwarf plants 1574 Tall and 554 dwarf plants were obtained in F₂. By chi-square test find out does the result agrees with the expected ratio 3:1, Calculate at 5% level of significance. [5]
b) What is regression? Write a note on linear regression analysis. [5]
- Q6)** a) Give an account on skewness and its measures. [5]
b) Explain the process of serial dilution for cell counting. [5]
- Q7)** a) Explain the procedure followed in testing of a hypothesis. [5]
b) Give the difference between Random and non random sampling. [5]
- Q8)** a) Write the meaning and uses of ANOVA. How is ANOVA table set up?[5]
b) Discuss the role of Bioinformatics in determining phylogenetic relationship. [5]



Total No. of Questions : 8]

SEAT No. :

P 3256

[5032] - 402

[Total No. of Pages :2

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 labeled diagrams must be drawn whenever necessary.*

- Q1)** a) Give an account of allelopathy in plants. [4]
b) Briefly comment on any two parasitic associations. [4]
c) What are competitive interactions? [2]
- Q2)** a) Give an account of epiphytic plants. [4]
b) How genetic engineering helps to improve tolerance against herbivores. [4]
c) What is mimicry? [2]
- Q3)** a) Write an account of any two carnivorous plants. [4]
b) Give brief account of insect - plant interactions. [4]
c) Briefly write on thermogenesis. [2]
- Q4)** a) Comment on algal-fungal association. [4]
b) Write on ectomycorrhiza. [4]
c) Mention forms of lichen thalli with examples. [2]

P.T.O.

- Q5)** a) Explain enclophytic fungal interactions. [5]
b) Write an archidaceous and ericaceons mycarrhiza. [5]
- Q6)** a) Comment on algal coral interactions. [5]
b) Write an symbiotic niterogen fixing bacteria. [5]
- Q7)** a) Discuss insect - fungus relationship. [5]
b) Comment on birds and mammals as an important pollinating agents. [5]
- Q8)** a) What are contrivances for cross pollination? [5]
b) Explain coevolution of fig - wasp interaction. [5]



Total No. of Questions : 8]

SEAT No. :

P3257

[5032]-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) Describe the process and manufacturing and canning of fruit beverages. [4]
b) Comment on medicinal herbs used in cosmetics. [4]
c) Enlist different styles of gardening. [2]
- Q2)** a) Describe the aromatic plants as a source of essence. [4]
b) Comment on transportation of ex-agal plantlets. [4]
c) Enlist any four medicinal herbs used in hair - dying. [2]
- Q3)** a) What is landscape gardening? Give the plan of garden for town and country sides. [4]
b) Discuss the environmental factors affecting deterioration of fruits. [4]
c) Mention the substrates used in hardening. [2]
- Q4)** a) Give an account of techno-commercial report of micro-propagation of sugarcane. [4]
b) Write a note on forest economics. [4]
c) What is maturity and harvest indices. [2]

P.T.O.

- Q5)** a) Briefly write on In-Vitro rooting and acclimatization of tissue culture raised Gerbera plantlets. [5]
b) Give an account of contribution of fruits to GDP. [5]
- Q6)** a) Write a note on medicinal mushroom for healthy life. [5]
b) Give an importance and scope of floriculture and add a note on cultivation of Gladiolus. [5]
- Q7)** a) Comment on laboratory design for plant tissue culture. [5]
b) Write a brief note on various styles of gardening. [5]
- Q8)** a) Discuss biotechnological approaches for improving post-harvest life of fruits. [5]
b) Write a note on value addition to bio-diversity through chemoprospection.[5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P3258

[5032] - 404

M.Sc. - II

BOTANY

BO - 4.4 : Plant Pathology

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

Time : 3 Hours]

[Max. Marks :50

Instructions to 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 are nematodes? Describe any one disease caused by nematodes. [4]
b) Explain pathogenicity of necrotrophic pathogens. [4]
c) What is horizontal resistance. [2]
- Q2)** a) Explain how plants defend themselves morphologically against plant pathogens. [4]
b) Explain the role of toxins in the development of diseases in plants. [4]
c) Write about the contributions of any one plant pathologist from abroad. [2]
- Q3)** a) Explain the role of soil pH and nutrients in disease development. [4]
b) Write about passive dispersal of plant pathogens. [4]
c) Mention any two objectives of plant pathology. [2]
- Q4)** a) Explain in brief about the disease cycle. [4]
b) Give an account on post-harvest diseases. [4]
c) What are phytoncides? [2]

P.T.O.

- Q5)** a) Explain briefly the biocontrol of plant pathogens. [5]
b) Give an account of any two viral diseases. [5]
- Q6)** a) Give a brief account on the effect of plant pathogens on plant physiological functions. [5]
b) Give the classification of plant diseases with examples. [5]
- Q7)** a) Describe any two breeding methods for improving disease resistance in plants. [5]
b) Write an account on the symptoms of plant diseases. [5]
- Q8)** a) Discuss different aspects of molecular biology of host - pathogen interaction. [5]
b) Write about the chemical control of plant diseases. [5]

