Total No. of Questions : 8]

SEAT No. :

P2416

[Total No. of Pages : 2

[4832] - 101

M.Sc. (Part - I) (Semester - I)

BOTANY

BO - 1.1 : Cryptogamic Botany - I (Credit System)

(2013 Pattern)

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 evolution in sporophytes of Bryophyta. **[4]**

b) Explain Apospory and Apogamy in Pteridophytes. **[3]**

c) Give distinguishing characters of Lycopodiales. **[3]**

Q2) a) Comment on Calamostachys. **[4]**

b) Give contribution of any one Bryologist. **[3]**

c) Draw and label L.S. of sporophyte of funaria. **[3]**

Q3) a) Give an account of ecological importance of Bryophyta. **[4]**

b) Comment on Lepidocarpon. **[3]**

c) Describe gametophyte of Polytrichum. **[3]**

Q4) a) Give an account of order Sphagnales. **[5]**

b) Describe gametophyte of Isoetales. **[5]**

P.T.O.

Q5) a) Give an account of origin of pteridophyta. **[4]**

b) Draw and describe sporophyte of Notothallus. **[4]**

c) Give general characters of selaginellales. **[2]**

Q6) a) Write on order Junger manniales. **[4]**

b) Describe stelar evolution in pteridophytes. **[4]**

c) What is heterospory. **[2]**

Q7) a) Draw and describe sporocarp of salvinia. **[4]**

b) Write on order calobryales. **[4]**

c) Sketch and laber antheridium of Anthoceros. **[2]**

Q8) a) Give an account of gametophyte of Anthocerotales. **[5]**

b) Comment on Telome theory. **[5]**

⌘⌘⌘

Total No. of Questions : 8]

SEAT No. :

P2417

[Total No. of Pages : 2

[4832] - 102

M.Sc.

BOTANY

BO - 1.2 : Plant Physiology & Biochemistry (Credit System)

(2013 Pattern) (Semester - I)

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) Write on signal transduction in guard cell. **[4]**

b) Comment on Redox potential. **[3]**

c) Mention the types of carbohydrates with their examples. **[3]**

Q2) a) Give secondary & quaternary structure of protein. **[4]**

b) Write the principle & applications of IRGA. **[3]**

c) Explain photoperiodism. **[3]**

Q3) a) Write a note on biosynthesis of auxins. **[4]**

b) Comment on synthesis of amino acids. **[3]**

c) Briefly write on aguaporins. **[3]**

Q4) a) Discuss β - oxidation of fatty acids. **[5]**

b) Give biosynthetic pathway of alkaloids. **[5]**

P.T.O.

Q5) a) Write a note on ammonium assimilation mechanism. **[4]**

b) Give factors affecting enzyme activity. **[4]**

c) What are pyrines & pyrimidines. **[2]**

Q6) a) Write mechanism of action of phytochrome. **[4]**

b) Write on TCA cycle. **[4]**

c) Enlist the plant growth regulators with example. **[2]**

Q7) a) Give biosynthesis of starch. **[4]**

b) Comment on cyanide resistance pathway. **[4]**

c) Enlist various secondary metabolites with example. **[2]**

Q8) a) Explain mechanism of resistance of plant to biotic stress. **[5]**

b) Write on metabolic changes during seed germination. **[5]**

⌘⌘⌘

Total No. of Questions : 8]

SEAT No. :

P2418

[Total No. of Pages : 2

[4832] - 103

M.Sc.

BOTANY

BO - 1.3 : Genetics & Plant Breeding

(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 labeled diagrams wherever necessary.***

Q1) a) Explain factors affecting gene & gene frequency. **[4]**

b) Write an account on lod score for linkage testing. **[3]**

c) Describe biochemical mutations. **[3]**

Q2) a) Describe the mechansim of specialized transduction. **[4]**

b) Give role of karyotype in plant species identification. **[3]**

c) Write on aneuploids. **[3]**

Q3) a) Explain the mechanism of genetic recombination. **[4]**

b) Write on BA translocation. **[3]**

c) Give characters of multiple alleles. **[3]**

Q4) a) Explain mechanism of tetrad analysis in unordered tetrad. **[5]**

b) Describe the structure & organisation of chromosome. **[5]**

P.T.O.

Q5) a) Describe conditional mutations. **[4]**

b) Write on linkage map. **[4]**

c) Give applications of marker assisted selection. **[2]**

Q6) a) Write the importance of 3 point test cross in genetic mapping. **[4]**

b) Comment on Heritability & its measurement. **[4]**

c) Give methods of clonal selection. **[2]**

Q7) a) Explain role of physical mutagens in mutation breeding. **[4]**

b) Comment on method of clonal selection. **[4]**

c) Give objectives of plant breeding. **[2]**

Q8) a) Explain the inheritance of chloroplast gene in Mirabillis Jalapa. **[5]**

b) Describe cytological & genetical method of identification of allowpolyploids. **[5]**

⌘⌘⌘

Total No. of Questions : 8]

SEAT No. :

P2419

[Total No. of Pages : 2

[4832] - 104

M.Sc. - I (Semester - I)

BOTANY

BO - 1.4: Botanical Techniques

(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 wherever necessary.***

Q1) a) What is DNA fingerprinting? Describe various steps involved in DNA fingerprinting technique. **[4]**

b) Explain working of UV-Visible spectroscopy. **[3]**

c) Write note on laser assisted microscopy. **[3]**

Q2) a) Explain the technique of Automated DNA sequencing. **[4]**

b) Enlist Application of IR spectroscopy. **[3]**

c) Describe squash technique. **[3]**

Q3) a) Describe Ion exchange chromatography technique. **[4]**

b) Comment on SDS-PAGE gel electrophoresis. **[3]**

c) Write note on green Fluorescence protein. **[3]**

P.T.O.

Q4) a) Describe Maxam Gilbert's method of DNA sequencing. **[5]**

b) Explain working and principle of Atomic absorption spectroscopy. **[5]**

Q5) a) Explain Gel filtration chromatography technique. **[4]**

b) State working and principle of phase contrast microscopy. **[4]**

c) Define Denaturing. **[2]**

Q6) a) Describe the procedure of ELISA. **[4]**

b) State properties of Rodioisotopes used in biology. **[4]**

c) Enlist Application of Gel filtration chromatography. **[2]**

Q7) a) Explain the principle of electrical conductivity meter. **[4]**

b) Explain Beer's and Lambert's law. **[4]**

c) Define Dispersion of light. **[2]**

Q8) a) Describe working of spectroflurometry. **[5]**

b) What is electron microscope? Describe working of TEM. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2420

[Total No. of Pages : 2

[4832] - 201

M.Sc. - I (Semester - II)

BOTANY

BO - 2.1 : Cryptogamic Botany - II (Algae & Fungi)

(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) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) a) Write Bold and Wyne's system of classification of Algae. **[4]**

b) Comment on evolution of asexual reproduction in Zygomycotina. **[4]**

c) What is molecular systematics. **[2]**

Q2) a) Give Alexopoulus, Mims and Blackwell system of classification of fungi. **[4]**

b) Comment on algal habitats. **[4]**

c) Give contribution of any two mycologist in India. **[2]**

Q3) a) Comment on filamentous and multicellular green algae. **[4]**

b) What are Myxomycetes? Write life-cycle pattern in Myxomycotina. **[4]**

c) Give difference between saprophytes and parasites. **[2]**

P.T.O.

Q4) a) Describe types of fructifications in Ascomycotina. **[4]**

b) Comment on thallus organisation and cell structure in Cyanophyta. **[4]**

c) Write on origin of green algae. **[2]**

Q5) a) Give brief account of Mycorrhiza and write its importance. **[5]**

b) Comment on Bacillariophyta. **[5]**

Q6) a) What are Teliomycetes? Comment on its life cycle pattern. **[5]**

b) Comment on parasexual cycle. **[5]**

Q7) a) Give distinguishing characters of charophyta and comment on its reproductive structures. **[5]**

b) Write on morphology and anatomy of lichen thallus. **[5]**

Q8) a) Give an account of hamathecium and centrum in Ascomycetes. **[5]**

b) Write briefly on Hymenomycetes. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. : ____

P2421

[Total No. of Pages : 2

[4832] - 202

M.Sc. (Semester - II)

BOTANY

BO - 2.2 Cell Biology and Evolution (Theory)

(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 diagrams, wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Explain structure of plasmodesmata. Add a note on role of movement of molecules. **[4]**

b) Give role of Golgi complex in sorting, storage and secretion. **[4]**

c) What is Genetic drift? **[2]**

Q2) a) Explain biogenesis of Mitochondria. **[4]**

b) Write mechanism of transport across membrane. **[4]**

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

Q3) a) Give concept Darwinism with suitable. Example. **[4]**

b) Write briefly on any two types. of. recepter proteins. **[4]**

c) Enlist functions of cell wall. **[2]**

P.T.O.

Q4) a) What is signal transduction? Explain G-protein coupled receptors. **[4]**

b) Explain Hardy-Weinberg law with suitable example. **[4]**

c) Give role of vacuole as storage organelle. **[2]**

Q5) a) Explain role of cyclin protein kinase in regulation of cell cycle. **[5]**

b) Write on cell theory. **[5]**

Q6) a) Comment on convergent evolution. **[5]**

b) Briefly write on Lamarckism. **[5]**

Q7) a) Explain cell cycle with reference to molecular events. **[5]**

b) Describe different types of fossils. **[5]**

Q8) a) Explain genetic control of Apoptosis. **[5]**

b) Comment on passive transport of ions. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2422

[Total No. of Pages : 2

[4832] - 203

M.Sc. - I (Semester - II)

BOTANY

BO - 2.3 : Molecular Biology and Genetic Engineering

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

Q1) a) Explain RNA as genetic Material. **[4]**

b) Describe rolling circle DNA replication. **[4]**

c) Enlist the types of DNA damage. **[2]**

Q2) a) Explain mechanism of protein folding & processing in eukaryotes. **[4]**

b) Comment on Lac operon model. **[4]**

c) Write role of promoters and terminators. **[2]**

Q3) a) Briefly write note on restriction endonuclease and their role in genetic engineering. **[4]**

b) Explain methods for selection of recombinants. **[4]**

c) What is reverse transcriptase? Write its role. **[2]**

P.T.O.

Q4) a) What is genomic DNA library? Give steps for preparation of genomic DNA library. **[4]**

b) Write methods for screening of transformants. **[4]**

c) What is southern blotting? Give its applications. **[2]**

Q5) a) Explain the mechanism of transcription in eukaryotes. **[5]**

b) Write on unique, moderately repetative & highly repetative DNA forms. **[5]**

Q6) a) Enlist vectors in gene cloning. Discuss any two vectors in detail. **[5]**

b) Write any two DNA repair mechanism. **[5]**

Q7) a) Give applications of genetic engineering in biotic stress tolerance in plants with examples. **[5]**

b) Discuss the role of kinase and phosphatase in plant genetic engineering. **[5]**

Q8) a) Explain indirect gene transfer method in plants. **[5]**

b) Write on replication apparatus. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2423

[Total No. of Pages : 2

[4832] - 204

M.Sc (Semester - II)

BOTANY

BO - 2.4 - Plant Ecology and Phytogeography

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

Q1) a) Explain plant relation with respect to soil moisture and soil nutrients. **[4]**

b) Describe distribution of plants with respect to climatic factors. **[4]**

c) Comment on components of ecosystem. **[2]**

Q2) a) Describe C-S-R triangle. **[4]**

b) Write adaptive responses of plant to variation in light. **[4]**

c) Enlist floristic regions of India. **[2]**

Q3) a) Explain components of any two biomes. **[4]**

b) Explain plant distribution with respect to centres of origin. **[4]**

c) Comment on any two levels of diversity. **[2]**

P.T.O.

Q4) a) Comment on population viability analysis. **[4]**

b) Explain forest ecosystem in brief. **[4]**

c) Comment on plant succession. **[2]**

Q5) a) Comment on carbon sequestration. **[5]**

b) Explain factors affecting population size. **[5]**

Q6) a) Discuss metapopulation concept. **[5]**

b) Describe major plant communities of the world. **[5]**

Q7) a) Describe Hydrosere. **[5]**

b) Describe terrestrial ecology. **[5]**

Q8) a) Describe in brief endemism and EIA. **[5]**

b) Explain plant relation with respect to water and temperature. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2424

[Total No. of Pages : 2

[4832] - 301

M.Sc (Semester - III)

BOTANY

BO - 3.1 - Spermatophytic 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) ***Neat labelled diagram must be drawn wherever necessary.***

Q1) a) Give general character's of pteridospermales. **[4]**

b) Write distribution of Gymnosperms in India. **[4]**

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

Q2) a) Enlist general characters of Cycadales. **[4]**

b) Briefly comment on sporophyte of coniferales. **[4]**

c) Give classification of Gymnosperms as per chamberlain (1934). **[2]**

Q3) a) Discuss post Darwinian classification system. **[4]**

b) Write systematic position of Aristolochiaceae. **[4]**

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

P.T.O.

Q4) a) Write on Endemism in western Ghats. **[4]**

b) Morphological variations in Magnoliaceae. **[4]**

c) What is cladistic in taxonomy? **[2]**

Q5) a) Write affinities of Gymnosperms with pteridophytes and Angiosperms. **[5]**

b) Give an outline classification of Gymnosperms as per sporne (1965). **[5]**

Q6) a) Describe male and female cone in Ginkgoales. **[5]**

b) Write differences and similarities between Gnetales and welwitschiales. **[5]**

Q7) a) Give an outline of Cronquist system or classification. **[5]**

b) Comment on morphological variations and phylogeny of Nymphaeaceae. **[5]**

Q8) a) Write provisions for the governance or ICBN. **[5]**

b) Give merits and demerits of Takhtajan system of classification. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. : ____

P2425

[Total No. of Pages : 2

[4832] - 302

M.Sc. (Semester - III)

BOTANY

BO - 3.2 - Developmental and Economic 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 wherever necessary.***

Q1) a) What is meristem? Justify" It is dynamic center of cell regeneration". **[4]**

b) Explain the various factors affecting developmental process. **[4]**

c) Define "Commitment". **[2]**

Q2) a) Comment on the developmental mechanism of microsporogenesis. **[4]**

b) What is polyembryony? Explain it with suitable example. **[4]**

c) Write on "Parthenogenesis". **[2]**

Q3) a) Discuss gene expression during transition of vegetative meristem into flowering. **[4]**

b) Write role of hormone in plant development. **[4]**

c) What is cell incompatibility. **[2]**

P.T.O.

Q4) a) What are essential oils? Give sources and method of cultivation. **[4]**

b) Comment on sugar Industry and add note on its by-products. **[4]**

c) Give economic importance of spices. **[2]**

Q5) a) What is gametic fusion? Write the significance of double fertilization. **[5]**

b) Comment on "Anther culture". **[5]**

Q6) a) Give an account of seed germination. **[5]**

b) Write the cultivation method and medicinal uses of garlic. **[5]**

Q7) a) Give sources and economic uses of camphor and sarson oil. **[5]**

b) Write note on apospory and megasprogenesis. **[5]**

Q8) a) Give the difference between unclassified and reduced embryo. **[5]**

b) Comment on Cell-Cell interaction. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. : ____

P2426

[Total No. of Pages : 2

[4832] - 303

M.Sc - II (Semester - III)

BOTANY

BO - 3.3 - Industrial Botany - I

(2013 Pattern) (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) Comment on Azadiractine as a bio-pesticide. **[4]**

b) Describe the process of distillation & dehydration of bio-ethanol. **[4]**

c) Give the advantages of bio-diesel from algae over other sources. **[2]**

Q2) a) What is entrepreneur? Give the difference between entrepreneur of manager. **[4]**

b) Write on Trichograma as a bio-pesticide. **[4]**

c) Enlist the sources of bio-fuel. **[2]**

Q3) a) Give the application & future prospectus of bio-hydrogen. **[4]**

b) Add a note on project identification & selection process. **[4]**

c) What is SIDCO? **[2]**

P.T.O.

Q4) a) Describe the process of liquid seaweed fertilizer production. **[4]**

b) Comment on button mushroom production process. **[4]**

c) What is methanogenesis. **[2]**

Q5) a) Justify the resource potential of algae w.r.t pharmaceuticals and neutraceuticals. **[5]**

b) Write a note on bio-ethanol production from liqnocellulose. **[5]**

Q6) a) List the commercial banks & explain any one as finance to entrepreneur. **[5]**

b) Describe the method of pencillin production. **[5]**

Q7) a) Explain the process of isolation & mass multiplication of Trichoderma. **[5]**

b) Comment on nature & scope & business. **[5]**

Q8) a) Explain the sources & method of akohol production. **[5]**

b) Describe the process of bio-fuel production from micro-algae. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2427

[Total No. of Pages : 2

[4832] - 304

M.Sc. (Semester - III)

BOTANY

BO - 3.41 - Advanced Mycology and Plant Pathology

(2013 Pattern) (Special) (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) State relationships of fungi with plants and animals. **[4]**

b) Explain Dictyosteliomycetes. **[4]**

c) Give contributions of Anton De Bary. **[2]**

Q2) a) Comment on fungal growth. **[4]**

b) Describe asexual spores in fungi. **[4]**

c) What are straminipila? **[2]**

Q3) a) Comment on stress tolerant strategies in fungi. **[4]**

b) Write on cellular slime moulds. **[4]**

c) What are Tremellales? **[2]**

P.T.O.

Q4) a) Briefly write on any four ecological groups in fungi. **[4]**

b) Write on sporangiophore morphology in Oomycota. **[4]**

c) Explain fruit bodies in myxomycetes. **[2]**

Q5) a) Write Hawker's system of classification of fungi. **[5]**

b) Comment on plasmodiophoromycota. **[5]**

Q6) a) Explain different aspects of systemic mycosis. **[5]**

b) Write detail account of conidiomata. **[5]**

Q7) a) Comment on rust fungi. **[5]**

b) Write any two ecological services of fungi. **[5]**

Q8) a) "Fungi are ideal tools for genetical studies". Explain **[5]**

b) Explain different types of ascocarps in Ascomycota. **[5]**

XXXX

Total No. of Questions : 8]

SEAT No. :

P2428

[Total No. of Pages : 2

[4832] - 305

M.Sc (Part - II) (Semester - III)

BOTANY

BO - 3.42 - Advanced Angiosperms

(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 lablled diagram wherever necessary.***

Q1) a) Enlist embryological characters of taxonomic importance. Discuss the role of any two characters with suitable examples. **[4]**

b) What is karyotype? Describe the scope and importance of cytotaxonomy. **[4]**

c) Write briefly on seed proteins. **[2]**

Q2) a) What is NPC system? Discuss the role of pollen characters in taxonomy with examples. **[4]**

b) Give distinguishing characters of family Asteraceae. Describe floral variation in it. **[4]**

c) Write briefly on molecular diagnostic tools. **[2]**

Q3) a) Discuss the role of SEM and TEM studies in plant systematics. **[4]**

b) What is Numerical Taxonomy? Give its merits, demerits and applications. **[4]**

c) Write briefly on adaptations. **[2]**

P.T.O.

Q4) a) Enlist anatomical characters of taxonomic importance. Discuss the role of any two characters with suitable examples. **[4]**

b) Comment on genetic variations and plant systematics. **[4]**

c) Write briefly on chromosome banding. **[2]**

Q5) a) What is chemotaxonomy? Describe the stages in chemotaxonomic investigations. **[5]**

b) What are STP? Give their classification. Add note on their role in taxonomy. **[5]**

Q6) a) Explain floral variations and phylogency of family orchidaceae. **[5]**

b) Describe in detail phytogeographical regions of India. **[5]**

Q7) a) Describe the analysis of amino acid sequence and its significance in systematics. **[5]**

b) What is RAPD? Describe its applications in molecular systematics. **[5]**

Q8) a) Discuss the role of floral pigments in systematics of centrospermae. **[5]**

b) Describe figure, texture and grain in wood with suitable examples. **[5]**

XXXX

Total No. of Questions : 8] **SEAT No. :**

P2429 **[Total No. of Pages : 2**

[4832] - 306

M.Sc. - II (Botany) (Semester - III)

BO - 3.43 : ADVANCED PLANT PHYSIOLOGY

(2013 Pattern)

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 physiological traits useful for improvement of crop studied by you. **[4]**

b) What is photo periodism? Add a note on SDP with its example. **[4]**

c) Enlist the tree examples of C_3 & C_4 plants each. **[2]**

Q2) a) Explain about CO_2 response curve. **[4]**

b) Write about physiological mechanism developed by plant to protect against extreme stress (any one). **[4]**

c) Explain the mechanism of active uptake of minerals. **[2]**

Q3) a) What is role played by secondary metabolites in plants? **[4]**

b) Give an account of metabolism & allocation of resources during vegetative growth. **[4]**

c) What is role of AT Pase as transporter? **[2]**

Q4) a) Write a note on "Physiology of seed maturation". **[4]**

b) Give an account of strategies developed by plants for conservation of water. **[4]**

c) Role played by ethylene in fruit ripening. **[2]**

P.T.O.

Q5) a) Give an account of role played by microbes in making available the nutrients to plants. **[5]**

b) Write the comparative account of normal & cynide resistant respiration. **[5]**

Q6) a) What is the difference between chemical & conventional fertilizers. **[5]**

b) Give detailed account of respiration in response to acidosis metabolism during seed germination. **[5]**

Q7) a) Explain in detail on CAM pathway in desert plants. **[5]**

b) What is water potential? Add note on factors influencing water transport. **[5]**

Q8) a) Describe photosynthetic ETS in prokaryotes. **[5]**

b) Give an account of role GA as PGR. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2430

[Total No. of Pages : 2

[4832] - 307

M.Sc. - II (Botany)

BO-3.44 : ADVANCED GENETICS & MOLECULAR BIOLOGY

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

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

Q1) a) Explain Eukaryotic transposable elements. AC & DS elements in maize. **[4]**

b) Describe molecular structure of centromere & telomere in Eukaryote. **[4]**

c) Comment on lamp brush chromosome. **[2]**

Q2) a) Describe genetic organization of T_4 Bacteriophase. **[4]**

b) Comment on interaction between plasmids & hosts. **[4]**

c) Write on single burst experiment. **[2]**

Q3) a) Explain the method of characterization & expression of gluten protein genes. **[4]**

b) Add a note on DNA typing & Population structure. **[4]**

c) Comment on gene silencing. **[2]**

Q4) a) Discuss direct gene mutation & give the method of detection of delection mutation. **[4]**

b) Explain the mechanism of single site specific recombination in phage. **[4]**

c) Write on expansion mutation. **[2]**

P.T.O.

Q5) a) Give an account of Tn10 transposon in bacteria. **[5]**

b) Write a note on conjugal functions in plasmids. **[5]**

Q6) a) Comment on allele frequencies in genotype frequencies & their calculations. **[5]**

b) Give method of detection of duplications & inversions. **[5]**

Q7) a) Explain the arrangement of chromatin fibers in Eukaryotic chromosomes. **[5]**

b) Describe one step growth experiment in bacterio phage. **[5]**

Q8) a) Discuss genetics of wheat & comment on gliadin genes. **[5]**

b) Write on microsattelites. **[5]**

● ● ●

Total No. of Questions : 8]

SEAT No. :

P2431

[Total No. of Pages : 2

[4832] - 308

M.Sc. (BOTANY)

BO-3.45 : Advanced Plant Biotechnology

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

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 wherever necessary.***

Q1) a) Describe the role of transgenics for insect resistance with Bt gene. **[4]**

b) Discuss use of knock out mutants in alteration of gene expression. **[4]**

c) Enlist steps of any one technique of DNA sequencing. **[2]**

Q2) a) Comment on technique of screening and selection of high secondary metabolite producing lines. **[4]**

b) Explain genes with suitable transgenic examples used for obtaining fungal disease resistance. **[4]**

c) What are ESTs? Enlist their uses. **[2]**

Q3) a) Write methods of PCR and add a note on applications of PCR. **[4]**

b) Discuss parameters of growth and product analysis for secondary metabolite production. **[4]**

c) Enlist two genes with suitable examples for obtaining drought stress resistance. **[2]**

Q4) a) Explain the method of gene cloning with the help of lambda phage vector. **[4]**

b) Enlist various genes and their successful transgenic examples for obtaining salltolerant plants. **[4]**

c) Give design of stirred tank bioreactor. **[2]**

P.T.O.

Q5) a) Write the strategies to develop drought resistant transgenic plants. **[5]**

b) Describe enhancement of secondary metabolite production with the help of nutrient media manipulation in tissue culture. **[5]**

Q6) a) Comment on any two vectors and their use in gene cloning with examples. **[5]**

b) Give the mechanism of gene tagging and plasmid rescue. **[5]**

Q7) a) Explain invitro gene cloning by PCR method. **[5]**

b) Differentiate between biotic and abiotic elicitors. **[5]**

Q8) a) Describe Northern hybridization technique. **[5]**

b) What are restriction enzymes? Live their role in recombinant DNA technology. **[5]**

Total No. of Questions : 8] **SEAT No. :**

P2432 **[Total No. of Pages : 2**

[4832] - 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 wherever necessary.***

Q1) a) Discuss cultivations and utilization of Aromatic plants in India. **[4]**

b) Give detailed account of Eucalyptus and isabgol with respect to source, cultivation and collection of drug. **[4]**

c) What is immunomodulatory medicinal plant? **[2]**

Q2) a) Comment on Biosynthesis of glycosides. **[4]**

b) Write a note on biogenesis of phytopharmaceuticals. **[4]**

c) Enlist the traditional and alternative system of medicine. **[2]**

Q3) a) Discuss Ayurvedic Profile of Bhringraj. **[4]**

b) Comment on Biological and chemical method of evaluation. **[4]**

c) Write applications of Vinca **[2]**

Q4) a) Give detailed account of liquorice and shatavari with respect to source, cultivation and collection. **[4]**

b) Comment on pharmacological classification of crude drug. **[4]**

c) Write applications of pepper mint. **[2]**

P.T.O.

Q5) a) Enumerate applications of Ashwagandha and Vasaka. **[5]**

b) Write on Ayurvedic Profile of Gulvel and hirda. **[5]**

Q6) a) Prepare a note on Tobacco and Deris. **[5]**

b) Explain pharmacoguostic studies with respect to source, cultivation, collection, macroscopic characters and application of Turmeric. **[5]**

Q7) a) Discuss method of cultivation and factors affecting cultivation of medicinal plant. **[5]**

b) Write on Analytical Pharmacognosy with respect to drug adulteration. **[5]**

Q8) a) Discuss history, definition and scope of pharmacognocy. **[5]**

b) Comment on Industrial aspects of pharmacognosy with respect to Neutraceuticals and cosmaceuticals. **[5]**

● ● ●

Total No. of Questions : 8]

SEAT No. :

P2433

[Total No. of Pages : 2

[4832] - 311

M.Sc. (Botany)

BO-3.48 : ADVANCED SEED TECHNOLOGY

(2013 Pattern) (Special) (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 diagrams must be drawn wherever necessary.***

Q1) a) Give difference between seed and grain. **[4]**

b) Comment on autogamy and allogamy. **[4]**

c) Define seed dormancy. **[2]**

Q2) a) Explain seed village concept. **[4]**

b) Give objectives of seed testing. **[4]**

c) What are breeders seeds? **[2]**

Q3) a) Comment on quick viability test. **[4]**

b) Give an account of entry point and mechanism of seed transmission. **[4]**

c) Define genetic purity of seed. **[2]**

Q4) a) Discuss grow out test. **[4]**

b) Give economic importance of seed borne diseases. **[4]**

c) What is seed deterioration? **[2]**

Q5) a) Write difference between orthodox and recalcitrant seeds. **[5]**

b) Give an account of seed production in cotton. **[5]**

P.T.O.

Q6) a) Explain construction and working of specific gravity separator. **[5]**

b) Describe structure of megasporangium. **[5]**

Q7) a) Write procedure for field inspection. **[5]**

b) Give an account of preventive measures of seed deterioration. **[5]**

Q8) a) Comment on ISTA. **[5]**

b) Give the causes of seed deterioration. **[5]**

● ● ●

Total No. of Questions : 8]

SEAT No. :

P2434

[Total No. of Pages : 2

[4832] - 312

M.Sc. (Botany)

BO-3.50 : ADVANCED BIODIVERSITY

(2013 Pattern) (Special) (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) Explain Urban and Peri-urban diversity. **[4]**

b) Describe Gymnosperm diversity with reference to distribution and evolutionary success. **[4]**

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

Q2) a) Describe Bryophyte diversity with reference to habit and habitat. **[4]**

b) Write in brief Temperate and Boreal forest ecosystems. **[4]**

c) What is Gamma diversity? **[2]**

Q3) a) Describe habitat fragmentation and metapopulation concept. **[4]**

b) Explain identification of diversity hotspots. **[4]**

c) Write on diversity indices based on species abundance. **[2]**

Q4) a) Give the current status of plant diversity. **[4]**

b) Explain founder effects and genetic drift. **[4]**

c) Comment on different sampling techniques for monitoring fish biodiversity. **[2]**

Q5) a) Discuss the concept of conservation of Genetic, species and ecosystem diversity. **[5]**

b) Comment on Protected areas of biosphere reserves. **[5]**

P.T.O.

Q6) a) Write any two methods of ex-situ conservation of biodiversity. **[5]**

b) Give the role of educational institutes in biodiversity conservation. **[5]**

Q7) a) Explain factors affecting species distribution. **[5]**

b) Write uses of biodiversity as food and fodder. **[5]**

Q8) a) Describe the role of biotechnology in assessment of biodiversity and bioresources. **[5]**

b) Discuss abundance of species in different ecosystems of the world. **[5]**

Total No. of Questions : 8]

SEAT No. : ____

P2435

[Total No. of Pages : 2

[4832] - 401

M.Sc. - II

BOTANY

BO - 4.1 : Computational Botany

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

Time : 3 Hours] ***[Max. Marks : 50***

Instruction to the candidates:

1) ***Attempt any five questions.***
2) ***All questions carry equal marks.***

Q1) a) Following are the height of plant's (in cm.) of ten plant's.
56, 62, 70, 60, 68, 69, 65, 66, 58, 70 compute mean, mode and median. **[4]**

b) Draw scattered diagram of following data, state your conclusion. **[4]**

Amount of Fertilizer	30	40	50	60	70	80
Yield	43	45	54	53	56	63

c) Explain osmolarity. **[2]**

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

b) What are database? Write down few examples of database. **[4]**

c) Write on bioinformatics and its applications. **[2]**

Q3) a) Describe specific activity of radioisotopes. **[4]**

b) What are the $[H^+]$ $[OH^-]$, pH and pOH of a 0.002M solution of HNO_3? **[4]**

c) Explain molarity of solution. **[2]**

Q4) a) Explain following three fundamental principles of design of experiment.
i) Randomization.
ii) Replication
iii) Local control **[4]**

b) Explain Duncan's multiple range test. **[4]**

c) What is Null hypothesis. **[2]**

P.T.O.

Q5) a) In grassland community the lichen population was sampled from the ten randomly located plots of one meter square area the following table gives the number of lichens obtained. Examine the distribution pattern of lichens normal or abnormal. **[5]**

Area	1	2	3	4	5	6	7	8	9	10
Lichens/m^2	25	32	17	23	15	39	27	19	22	26

b) Compute pearson's coefficient of correlation. **[5]**

Amount of Fertilizer (X)	30	40	50	60	70	80
Yield (Y)	43	45	54	53	56	63

Q6) a) Explain randomized block design (RBD). **[5]**

b) Describe multiple sequence alignment in sequence similarities. **[5]**

Q7) a) Explain the principle of haemocytometry for cell counting. **[5]**

b) Comment on EMBEL and NCBI in data base. **[5]**

Q8) a) Describe Nerst and Goldmann equations. **[5]**

b) Explain skewness and kurtosis. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2436

[Total No. of Pages : 2

[4832] - 402

M.Sc. - II

BOTANY

BO - 4.2 : Plant-Organism Interactions

(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) Discuss different forms of lichens with examples. **[4]**

b) Write briefly on endophytic fungi. **[4]**

c) What is VAM? **[2]**

Q2) a) Comment on nodulating bacteria. **[4]**

b) Give an account of coral reef symbiosis in plants. **[4]**

c) What is thermogenesis. **[2]**

Q3) a) Comment on wood-wasp fungus symbiosis. **[4]**

b) Explain contrivanses for cross pollination. **[4]**

c) Comment on orchidiaceous mycorrhizae. **[2]**

Q4) a) Explain fig-fig wasp interaction. **[4]**

b) Write co-evolution of humming bird and plant interaction. **[4]**

c) Write on seed morphology relavent to seed dispersal mechanism. **[2]**

Q5) a) Discuss parasitic association in plants. **[5]**

b) State different competative mechanisms in plants. **[5]**

Q6) a) Discuss different aspects of allelopathy with examples. **[5]**

b) Comment on insect-plant interaction. **[5]**

P.T.O.

Q7) a) Give an account of epiphytic plants. **[5]**

b) Write an account of an improved tolerance by genetic engineering. **[5]**

Q8) a) Discuss different aspects of carnivorous plants. **[5]**

b) Comment on plant signaling and defence against herbivores. **[5]**

● ● ●

Total No. of Questions : 8] **SEAT No. :**

P2437 **[Total No. of Pages : 2**

[4832] - 403

M.Sc. (Botany)

BO - 4.3 : INDUSTRIAL BOTANY (Part - 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 diagrams must be drawn wherever necessary.***

Q1) a) What is sterilization? Explain various methods of sterilization of glassware. **[4]**

b) Discuss importance of packaging of cut flowers. **[4]**

c) What is herbal technology? **[2]**

Q2) a) Describe the process of initiation of cultures during micropropagation of Lilium. **[4]**

b) Explain the principles of conventional methods of preservation of fruits. **[4]**

c) Write a note on principles of garden design. **[2]**

Q3) a) Explain the role of phyto-technology in value addition to biodiversity through chemo prospection. **[4]**

b) Write about role of katha and Ravenchi wood in cotton and silk industry. **[4]**

c) Write a note on maintenance of plant tissue culture laboratory. **[2]**

Q4) a) Describe role of aromatic plants as a source of essence. **[4]**

b) Explain landscaping of educational institutes and factories. **[4]**

c) Comment on contribution of fruit production to GDP. **[2]**

P.T.O.

Q5) a) Explain cultivation of orchids. **[5]**

b) Describe role of seeds of Bixa in cotton and silk industry. **[5]**

Q6) a) Discuss steps involved in micropropagation of Gerbera. **[5]**

b) Explain environmental factors affecting deterioration of fruits. **[5]**

Q7) a) Describe the steps involved in manufacturing and canning of fruit beverages. **[5]**

b) Explain economics of micropropagation of sugarcane. **[5]**

Q8) a) Explain the importance of medicinal plants mentioned in Atharva Veda. **[5]**

b) Discuss role of forest resources. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2438

[Total No. of Pages : 2

[4832] - 404

M.Sc. (Semester - IV)

BOTANY

BO - 4.4 : PLANT PATHOLOGY

(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) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) a) Give an account of nematodal diseases in plants. **[4]**

b) Write on phytoalexin. **[4]**

c) What are host-R genes? **[2]**

Q2) a) Comment on biological and chemical activators in disease resistance. **[4]**

b) Write on forecasting of plant diseases. **[4]**

c) What is pathogenicity? **[2]**

Q3) a) Explain biochemical defense in plants. **[4]**

b) Briefly write on plant disease assessment methods. **[4]**

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

Q4) a) Write on bacterial diseases of plants. **[4]**

b) Explain mode of penetration of pathogens in plants. **[4]**

c) Enlist any four fungal diseases of plants with causal organisms. **[2]**

Q5) a) Give role of environmental factors in disease development. **[5]**

b) Comment on breeding methods for improving resistance in plants. **[5]**

P.T.O.

Q6) a) Explain genetics of host parasitic interactions. **[5]**

b) Comment on use of fungicides in plant disease control. **[5]**

Q7) a) Comment on effect of pathogen on physiological functions of plant. **[5]**

b) Give concept of post harvest diseases in plants. **[5]**

Q8) a) Comment on bio-control of plant diseases. **[5]**

b) Discuss plant diseases and human affairs. **[5]**