Total No. of Questions :8]

SEAT No. :

P2142

[Total No. of Pages :2

[5329] - 101

M.Sc - I

BOTANY

Bo - 1.1 : Cryptogamic Botany - I

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

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

Instructions to the candidates:

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

Q1) a) In what way bryophytes are different from pteridophytes? **[4]**

b) Give the classification of pteridophytes as per Sporne (1975) **[4]**

c) Write a note on calamites. **[2]**

Q2) a) Explain the evolution of steles in pteridophytes. **[4]**

b) Give the economic importance of Bryophytes. **[4]**

c) Write the contributions of any one Bryologist. **[2]**

Q3) a) Comment on fossil bryophytes. **[4]**

b) Give the characters of Annularia and calamostachys. **[4]**

c) Give a brief account on parthenogenesis **[2]**

Q4) a) Explain how bryophytes act as indicators of pollution. **[4]**

b) Write the classifications of Bryophytes as given by G.M. smith. **[4]**

c) Comment on apogamy and apospory. **[2]**

P.T.O.

Q5) a) Mention the distinguishing characters of Lycopsida. Add a note on the life cycles pattern in selaginella. **[5]**

b) Give a brief account of sporophyt of sphagnales. **[5]**

Q6) a) Write a note on Metzeriales. **[5]**

b) Comment on sporophyte of Marattiales. **[5]**

Q7) a) Give distinguishing characters of psilopside, and add a note on the gametophyte of psilotum. **[5]**

b) Write the characters of filicophyta and discuss the life cycle pattern in filicales. **[5]**

Q8) a) Write the distinguishing characters of Hepaticopsida. Explain the gametophytic structure of Jungermanniales. **[5]**

b) Write an account of Bux baumiales **[5]**

♦ ♦ ♦

Total No. of Questions : 8]

SEAT No :

P 2143

[Total No. of Pages : 2

[5329]-102
M.Sc. - I
BOTANY
Bo 1.2 : Plant Physiology & Biochemistry
(2013 Pattern) (Semester - I) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Explain signal transduction. **[4]**

b) Discuss a biotic stress. **[4]**

c) Write on redox potential. **[2]**

Q2) a) Describe nitrogen fixation. **[4]**

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

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

Q3) a) Give the classification of carbohydrate. **[4]**

b) Write on working and application of grain moisture meter. **[4]**

c) Briefly write on purines. **[2]**

P.T.O.

Q4) a) Explain C_4 cycle. **[4]**

b) Comment on metabolic changes during seed germination. **[4]**

c) Give Ramchandran plot. **[2]**

Q5) a) Describe TCA cycle. **[5]**

b) Write general classification of proteins. **[5]**

Q6) a) Comment on RUBISCO activity. **[5]**

b) Discuss dissociations and associations constants. **[5]**

Q7) a) Explain the mechanism of absorption and transformation of radient energy. **[5]**

b) Write on biosynthesis of Abscisic acid. **[5]**

Q8) a) Comment on oxidation of lipid. **[5]**

b) Explain regulation of calrin cycle. **[5]**

x x x

Total No. of Questions :8]

SEAT No : ____

P 2144

[Total No. of Pages :2

[5329]-103

M.Sc. - I

BOTANY

BO-1.3 :Genetics and Plant Breeding

(2013 Pattern) (Credit system) (Semester - I)

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

Instructions to the candidates:

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

Q1) a) Explain chromosomal theory of inheritance. **[4]**

b) What is segregation of alleles? **[4]**

c) Enlist chemical and physical mutagens. **[2]**

Q2) a) Write a note on inheritance of corolla length in Nicotiana. **[4]**

b) Discuss the concept of epistasis. **[4]**

c) What is erosion of genetic diversity? **[2]**

Q3) a) Briefly explain the mapping of bacterial genes by using interrupted mating. **[4]**

b) What are allopolyploids? **[4]**

c) Write on any one factor affecting gene frequencies. **[2]**

Q4) a) Describe maternal effect in inheritance. **[4]**

b) What is complementation test? **[4]**

c) Enlist pollination control mechanisms. **[2]**

P.T.O.

Q5) a) Write in brief on numerical alterations of chromosomes. **[5]**

b) Explain gene mapping by tetrad analysis in yeast. **[5]**

Q6) a) Describe one method of crop improvement for cross-pollinated crops. **[5]**

b) How LOD scores are used to test linkage of genes? **[5]**

Q7) a) Give types and detection of mutations. **[5]**

b) What are translocation heterozygotes? **[5]**

Q8) a) Give importance of hybridization in crop improvement. **[5]**

b) Describe lysogenic cycle in phages. **[5]**

✠✠✠✠✠

Total No. of Questions : 8]

SEAT No. :

P2145

[Total No. of Pages : 2

[5329]-104
M.Sc. - I
BOTANY
BO - 1.4 : Botanical Techniques
(2013 Pattern) (Semester - I) (Credit System)

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

Instructions to the candidates:

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

Q1) a) What is Density gradient centrifugation? **[4]**

b) Write principle of light microscopy. **[4]**

c) Give applications of ELISA. **[2]**

Q2) a) Enlist radio isotopes used in biology and write their properties. **[4]**

b) Describe rocket immuno-electrophoresis. **[4]**

c) Give working of camera lucida. **[2]**

Q3) a) Write factors affecting centrifugation. **[4]**

b) What is micrometry? **[4]**

c) Give applications of NMR spectroscopy. **[2]**

Q4) a) What is flow cytometry? **[4]**

b) Write a note on spectroflurometry. **[4]**

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

Q5) a) Give working and applications of uv-vis spectrophotometer. **[5]**

b) What is isoelectric focusing. **[5]**

P.T.O.

Q6) a) Describe Sanger's method of DNA sequencing. **[5]**

b) Explain the technique of two dimensional electrophoresis. **[5]**

Q7) a) Give principle and applications of affinity chromatography. **[5]**

b) What is sequencing of proteins? **[5]**

Q8) a) Describe in brief histochemical and cytochemical techniques. **[5]**

b) Write principle and applications of X-ray crystallography. **[5]**

⌘⌘⌘

Total No. of Questions :8]

SEAT No. :

P2146

[Total No. of Pages : 2

[5329]-201
M.Sc.-I (Part-II)
BOTANY
BO-2.1 : Cryptogamic Botany
(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) Give an account of any four sources of data for plant systematics. **[4]**

b) The outline classification of algae upto order level as proposed by bold and wyne. **[4]**

c) Mention any two economic aspects of algae. **[2]**

Q2) a) Write an account on the origin of green algae. **[4]**

b) What are mycorrhizae? Explain their importance in agriculture. **[4]**

c) Give any distinguishing characters and xanthophyta. **[2]**

Q3) a) Give the outline classification of fungi as proposed by Ainsworth et al 1973. **[4]**

b) Describe the reproductive bodies in Myxomycetes. **[4]**

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

Q4) a) Explain the concept of centrum in ascomycetes. **[4]**

b) Describe the types and structure of any two basidiocarps. **[4]**

c) What are mycotoxins? Give one example. **[2]**

Q5) a) Write about the evolution of sex in algae. **[5]**

b) Explain the life cycle pattern in Nostocales. **[5]**

P.T.O.

Q6) a) Comment on the morphology of thallus and anatomical pecularities in phaeophyta. **[5]**

b) Write an account on the types of lichens and nature of association of partners in them. **[5]**

Q7) a) Describe the life cycle pattern in chytridiomycetes. **[5]**

b) Give an account on phylogeny of fungi. **[5]**

Q8) a) Explain the types of conidia in Denteromycetes. **[5]**

b) Discuss the life cycle pattern in Gasteromycetes. **[5]**

ⓘⓘⓘⓘ

Total No. of Questions : 8]

SEAT No. :

P2147

[Total No. of Pages : 2

[5329]-202

M.Sc. - I

BOTANY

BO - 2.2: Cell Biology and Evolution

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

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 whenever necessary.***

Q1) a) Explain various system of transport across cell membrane. **[4]**

b) Give an account of etylene mediated two component system. **[4]**

c) State function of golgi complex. **[2]**

Q2) a) Comment on origin of basic biological molecules. **[4]**

b) Discuss molecular aspects of programmed cell death. **[4]**

c) What is speciation? Enlist its types. **[2]**

Q3) a) What is apoptosis? Explain its mechanism. **[4]**

b) Discuss phospholipid signaling mechanisms. **[4]**

c) Give function of E.R. **[2]**

Q4) a) Explain the structure and organisation of flagella. **[4]**

b) Give an account of ultra structure of E.R. **[4]**

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

P.T.O.

Q5) a) Describe the Miller Experiment. **[5]**

b) Comment on molecular organisation and biogenesis of chloroplast. **[5]**

Q6) a) Give an account of Ultra structure of golgi complex. **[5]**

b) Explain assembly and dissociation of ribosomes sub units. **[5]**

Q7) a) Write on geological time scale. **[5]**

b) Discuss Evolution of prokaryotes. **[5]**

Q8) a) Give the mechanism of transport of ions and solutes. **[5]**

b) Describe the mechanism of regulation of signaling. **[5]**

Total No. of Questions : 8]

SEAT No : ____

P 2148

[Total No. of Pages :2

[5329]-203
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) Describe rolling circle model of DNA replication. **[4]**

b) Explain packaging of genome in viruses. **[4]**

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

Q2) a) Discuss the mechanism of protein synthesis in eukaryotes. **[4]**

b) Comment on Arabinose operon. **[4]**

c) Write on prokaryotic terminators. **[2]**

Q3) a) Give the steps involved in construction of recombinant DNA molecule. **[4]**

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

c) What is eukaryotic transcriptor factors. **[2]**

Q4) a) Explain techniques of DNA isolation & purification. **[4]**

b) Discuss on handling of transformants in subsequent generation. **[4]**

c) Write on western blotting. **[2]**

P.T.O.

Q5) a) Explain DNA repair mechanism. **[5]**

b) What is ½ cot value? Give its significance. **[5]**

Q6) a) Explain the mechanism of positive & negative regulation of prokaryotic genes. **[5]**

b) Write in detail any two vectors used in gene cloning. **[5]**

Q7) a) Explain mechanism of transcription in prokaryotes. **[5]**

b) Enlist the names of enzymes used in genetic engineering. Explain any two in details. **[5]**

Q8) a) Give the applications of genetic engineering in lignin modification in plants. **[5]**

b) What is c-DNA library? Give steps for preparation of c-DNA library. **[5]**

✈ ✈ ✈

Total No. of Questions : 8]

SEAT No : ____

P 2149

[Total No. of Pages :2

[5329]-204
M.Sc. - I
BOTANY
BO - 2.4 : Plant Ecology and Phytogeography
(2013 Pattern) (Semester-II) (Credit System)

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

Instructions to the candidates:

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

Q1) a) State the effect of temperature on the plants. **[4]**

b) What are extinction events? **[4]**

c) Comment on water holding capacity of the soil. **[2]**

Q2) a) Explain desert ecosystem. **[4]**

b) Comment on EIA. **[4]**

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

Q3) a) What is acid rain? Explain its impact on vegetation. **[4]**

b) Comment on r and k selection. **[4]**

c) State the difference between autogenic and allogenic succession. **[2]**

Q4) a) Comment on fresh water ecosystem. **[4]**

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

c) State the zones of India on the basis of soil type. **[2]**

P.T.O.

Q5) a) State the sources of water pollution. **[5]**

b) Comment on life history strategies. **[5]**

Q6) a) Which factors affect the population size? **[5]**

b) Explain Xerosere. **[5]**

Q7) a) What are the adaptive responses of plants to variation in temperature. **[5]**

b) Give the components of Tundra biome. **[5]**

Q8) a) Explain endemism with examples. **[5]**

b) Comment on the effect of light on distribution of Vegetation. **[5]**

✈ ✈ ✈

Total No. of Questions : 8]

SEAT No : ____

P 2150

[Total No. of Pages :2

[5329]-301
M.Sc. - II
BOTANY
BO - 3.1 : Spermatophytic Botany
(2013 Pattern) (Semester-III) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Write general characters of Cordaitales. **[4]**

b) Discuss Pre-Darwinian systems of classification. **[4]**

c) Write an Welwitschia. **[2]**

Q2) a) Give general characters of cycadales. **[4]**

b) What are gymnosperms? Give classification of gymnosperms as per chamberlain (1934). **[4]**

c) Mention general principles of ICBN. **[2]**

Q3) a) Write merits and demerits of Takhtajan system of classification. **[4]**

b) Give systematic position of Nymphaeaceae. **[4]**

c) What is invasions and introductions. **[2]**

Q4) a) Discuss interrelationship an phytogeny of Magnoliales. **[4]**

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

c) Write an Hottest Hot spot. **[2]**

P.T.O.

Q5) a) Describe male and female cones in coniferales. **[5]**

b) Write affinities of gymnosperms with pteridophytes and angiosperms. **[5]**

Q6) a) Explain Taxonomic structure. **[5]**

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

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

b) What is Endemism? Explain their types. **[5]**

Q8) a) Comment on Angiosperm phylogeny group (APG). **[5]**

b) Write systematic position and phylogeny of Hydrocharitaceae. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2151

[Total No. of Pages : 2

[5329]-302

M.Sc. - II

BOTANY

BO 3.2 : Developmental and Economic Botany

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

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

Instructions to the candidates:

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

Q1) a) Write on intrinsic and extrinsic factors of plant development. **[4]**

b) Describe the process of megasporogenesis. **[4]**

c) What is commitment and redifferentiation. **[2]**

Q2) a) Discuss the role of ethylene in controlling plant development. **[4]**

b) Write on source, method of cultivation and uses of cotton and sunhemp. **[4]**

c) Give the economic importance of nuts. **[2]**

Q3) a) Comment on cell - cell interaction. **[4]**

b) Write on male germ unit. **[4]**

c) What is protoplast culture? **[2]**

Q4) a) Explain the role of phytochromes in plant development. **[4]**

b) Write on economic importance of ginger and turmeric. **[4]**

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

P.T.O.

Q5) a) What is microgametogenesis. **[5]**

b) Explain the role of meristem in plant development. **[5]**

Q6) a) Write on molecular development of root in plants. **[5]**

b) Comment on source, method of cultivation and economic importance of coffee. **[5]**

Q7) a) What is polyembryony? Write its causes. **[5]**

b) Comment on ABC model of flower development. **[5]**

Q8) a) What are millets? Write on cultivation of sorghum. **[5]**

b) Explain the concept of competence and determination. **[5]**

Total No. of Questions : 8]

SEAT No : ____

P 2152

[Total No. of Pages :3

[5329]-303

M.Sc. - II

BOTANY

BO 3.3: INDUSTRIAL BOTANY - I

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

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

Instructions to the candidates:

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

Q1) a) Describe use of algae as food & feed. **[4]**

b) Explain upstream & downstream processes of fermentation. **[4]**

c) Give distribution of economically important algae in India. **[2]**

Q2) a) State method of production of any one antibiotic by fermentation. **[4]**

b) Justify "Bioethanol is an alternative for fossil fuels". **[4]**

c) Enlist environmental implications of fossil fuels. **[2]**

Q3) a) Give an account of mass cultivation of Spirulina. **[4]**

b) Write on entrepreneurship development. **[4]**

c) Enlist the different sources for alcohol production. **[2]**

Q4) a) Distinguish between entrepreneur & manager. **[4]**

b) Write properties & uses of lipid biofuels. **[4]**

c) Give objectives of NABARD. **[2]**

P.T.O.

Q5) a) Discuss production method of button mushroom. **[5]**

b) Comment on Trichoderma as biopesticide. **[5]**

Q6) a) State applications & future prospects of bio-hydrogen. **[5]**

b) Explain the need & objectives of accounting for managment. **[5]**

Q7) a) Define methanogenesis. Describe process of biogas production from agroindustrial residues. **[5]**

b) Write about design & construction of fermenters. **[5]**

Q8) a) Give comparative account on business, employment & profession. **[5]**

b) Explain significance of insect predators as biopesticides with examples. **[5]**

✠✠✠✠✠

Total No. of Questions :8]

SEAT No. :

P2153

[Total No. of Pages :2

[5329] - 304

M.Sc - II

BOTANY

BO - 3.41 : Advanced Mycology and Plant Pathology

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

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

Instructions to the candidates:

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

Q1) a) Write Hawker's system of fungi classification. **[4]**

b) Write comment on chytridiomycetes. **[4]**

c) What are net slime moulds? **[2]**

Q2) a) Explain molecular aspects of fungal taxonomy. **[4]**

b) State any four ecological groups of fungi. **[4]**

c) Give brief account of any two fruit bodies in myxomycetes. **[2]**

Q3) a) Discuss tremellales and Dacrymycetales. **[4]**

b) Comment on Archiascomycetes. **[4]**

c) Give contributions of Anton deBary. **[2]**

Q4) a) What are ruderal strategies in fungi. **[4]**

b) Write briefly on fruit bodies in Denteromycota. **[4]**

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

P.T.O.

Q5) a) What are rusts? Comment on teliospore morphology in rusts. **[5]**

b) Discuss fungus - plant association. **[5]**

Q6) a) Discuss fruit body types in Ascomycotina. **[5]**

b) Explain clinical aspects of candidiasis and aspergillosis. **[5]**

Q7) a) Comment on agarics and polypores. **[5]**

b) What are peronosporales? Add a note on sporangiophore morphology. **[5]**

Q8) a) Write on gasteromycetes. **[5]**

b) Explain sporangia to conidial evolution in mucorales. **[5]**

Total No. of Questions :8]

SEAT No. :

P2154

[Total No. of Pages :2

[5329] - 305

M.Sc - II

BOTANY

BO - 3.42 : Advanced Angiosperms

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

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

Instructions to the candidates:

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

Q1) a) Justify: Pollen characters are taxonomically important. **[4]**

b) Comment on cladstics and clodogram. **[4]**

c) What is genetic variation. **[2]**

Q2) a) Discuss systematic position of Tiliaceae. **[4]**

b) Explain role of PCR analysis technique in systematics. **[4]**

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

Q3) a) Explain embryological data is useful in solving taxonomic problems. **[4]**

b) Comment on genetic variation in plant systematics. **[4]**

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

Q4) a) Explain use of amino acid sequence in systematics. **[4]**

b) Give applications of ultrastructural data in the classification of higher taxa. **[4]**

c) What is W/O pattern. **[2]**

P.T.O.

Q5) a) Discuss systematic position of Dilleniaceae. **[5]**

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

Q6) a) Justify: Embryological characters are taxonomically important. **[5]**

b) Give phylogeny and economic importance of Gentianaceae. **[5]**

Q7) a) Explain the Role of RFLP techniques in plant systematics. **[5]**

b) State merits and demerits of numerical taxonomy. **[5]**

Q8) a) Give application of serological data in plant systematics. **[5]**

b) Explain parsimony analysis techniques. **[5]**

♦ ♦ ♦

Total No. of Questions :8]

SEAT No. :

P2155

[Total No. of Pages :2

[5329] - 306

M.Sc. - II

BOTANY

Bo - 3.43 : Advanced Plant Physiology

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

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

Instructions to the candidates:

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

Q1) a) Explain role of microbe in availability of nutrients. **[4]**

b) Comment on relative growth in plant. **[4]**

c) What is mineral assimilation? **[2]**

Q2) a) Add a note on chlorophyll fluroscence Kinetics. **[4]**

b) Give the role of respiration in plant carbon balance. **[4]**

c) Write role of auxins in plants. **[2]**

Q3) a) Give an account of nutrient uptake mechanism in plants. **[4]**

b) Comment on role of growth regulator in plant growth. **[4]**

c) Enlist different secondary metabolites in plants. **[2]**

Q4) a) Explain light saturation curve. **[4]**

b) Write a note on physiology of seed germination. **[4]**

c) Give significance of cyanide resistance pathway. **[2]**

P.T.O.

Q5) a) Give an account of water conservation strategeis in plants. **[5]**

b) Discuss various physiological traits for crop improvement. **[5]**

Q6) a) Explain CAM pathway in aquatic plants. **[5]**

b) Write on biosynthetic pathway of terpenoids. **[5]**

Q7) a) Discuss factors influencing transport of water. **[5]**

b) Give an account of evolution of PEPcase. **[5]**

Q8) a) Explain cyanide resistance pathway in plants. **[5]**

b) Write on action of mechanism in plant for abiotic stress defense. **[5]**

Total No. of Questions :8]

SEAT No. :

P2156

[Total No. of Pages :2

[5329] - 307

M.Sc. - II

BOTANY

BO - 3.44 : Advanced Genetics & Molecular Biology

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

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

Instructions to the candidates:

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

Q1) a) State detail structure of eukaryotic chromosome. **[4]**

b) Give an account on Ac & D_s elements in maize. **[4]**

c) What are insertion sequences? **[2]**

Q2) a) Give an account on partitioning incompatability. **[4]**

b) Explain morphology & composition of T_4 bacteriophages. **[4]**

c) Write on initial stages of infection in T_4 bacteriophage. **[2]**

Q3) a) Comment on genetics of Wheat plant. **[4]**

b) Describe how allele frequencies & genotype frequencies are used for Hardy- weinberg principle testing. **[4]**

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

Q4) a) Explain teh mechanism of single site-specific recombination. **[4]**

b) Comment on genome sequencing. **[4]**

c) Write on genetic mapping. **[2]**

P.T.O.

Q5) a) Describe the structure of nucleosome & arrangement of chromatin fibers in a chromosome. **[5]**

b) Give an account of insertion sequences & Tn 10 transposon in bacteria. **[5]**

Q6) a) Write on genetic organization & types of mutations observed in T_4 genome. **[5]**

b) Discuss process of DNA replication in plasmid. **[5]**

Q7) a) Comment on the structure & evolution of high molecular weight. Subunits of gliadin genes. **[5]**

b) Discuss on DNA typing & population structure. **[5]**

Q8) a) Write on detections of duplications & inversions of gene mutation. **[5]**

b) Comment on manual DNA sequencing. **[5]**

♦ ♦ ♦

Total No. of Questions :8]

SEAT No. :

P2157

[Total No. of Pages :2

[5329] - 308

M.Sc. - II

BOTANY

BO - 3.45 : Advanced Plant Biotechnology

(2013 Pattern) (Credit System) (Special Paper) (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 use of plasmid & lambda phage vectors in gene cloning. **[4]**

b) Write the steps in gene tagging & its use. **[4]**

c) Enlist the applications of in vitro secondary metabolite production. **[2]**

Q2) a) Discuss the role of miRNA & siRNA in gene inhibition. **[4]**

b) How are ESTs obtained? Write their use. **[4]**

c) Write any two strategies to obtain glyphosate resistant plants. **[2]**

Q3) a) Write the steps in restriction mapping. Mention use of this technique. **[4]**

b) Comment on expression vectors. **[4]**

c) Write about any two genes to reduce post harvest losses of fruits. **[2]**

Q4) a) Explain the different ways for manipulation of nutrient media to improve secondary metabolite production. **[4]**

b) Discuss different strategies to obtain nematode resistant plants. **[4]**

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

P.T.O.

Q5) a) Write on "Transgenics for salt stress tolerance". **[5]**

b) Explain the technique of PCR. Write different methods & applications. **[5]**

Q6) a) Give different methods of immobilization of cells. **[5]**

b) Write an account of subtractive hybridization technique. **[5]**

Q7) a) What are different applications of transgenics in agriculture biotechnology? **[5]**

b) Comment on "Insertional Mutagenesis". **[5]**

Q8) a) Describe any one method of DNA sequencing. **[5]**

b) Write a note on "Types of bioreactors". **[5]**

♦ ♦ ♦

Total No. of Questions :8]

SEAT No. :

P2158

[Total No. of Pages :2

[5329] - 309

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 diagrams must be drawn wherever necessary.***

Q1) a) Give classification of crude drugs. **[4]**

b) Comment on drug adulteration. **[4]**

c) Write scope of pharmacognosy. **[2]**

Q2) a) Write on natural pesticides. **[4]**

b) Give applications of camphor. **[4]**

c) What is profile of drug? **[2]**

Q3) a) Describe cultivation method of shatavari. **[4]**

b) Give ayurvedic profile of gulvel. **[4]**

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

Q4) a) Explain biosynthesis of glycosides. **[4]**

b) Discuss chemical method of drug evaluation. **[4]**

c) What is crude drugs? **[2]**

P.T.O.

Q5) a) Give source, cultivation and application of Ashwagandha. **[5]**

b) Write principles and formulation of curcuma. **[5]**

Q6) a) Explain cultivation and utilization of medicinal plants in India. **[5]**

b) Briefly write on biosynthesis of alkaloids. **[5]**

Q7) a) Discuss principle and formulation of Behda. **[5]**

b) Comment on application of liquorice & Amla. **[5]**

Q8) a) Describe cultivation and utilization of aromatic plants in India. **[5]**

b) Write source, cultivation and applications of Arjuna. **[5]**

Total No. of Questions :8]

SEAT No. :

P2159

[Total No. of Pages :2

[5329] - 311

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 question carry equal marks.***
3) ***Draw neat labelled diagrams wherever necessary.***
4) ***Figures to the right indicate full marks.***

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

b) Describe seed structure. **[4]**

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

Q2) a) Comment on general principles of seed production. **[4]**

b) Write an account of specific gravity separator. **[4]**

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

Q3) a) Explain ELISA test in varietal identification. **[4]**

b) Comment on seed legislation in India. **[4]**

c) Write on seed deterioration. **[2]**

Q4) a) Comment on genetic purity. **[4]**

b) Write power's and duties of seed inspector. **[4]**

c) What is isolation distance? **[2]**

P.T.O.

Q5) a) Explain factors affecting seed germination. **[5]**

b) Comment on general principles of seed storage. **[5]**

Q6) a) What are the causes of seed deterioration. **[5]**

b) Discribe methods to break seed dormancy. **[5]**

Q7) a) Comment on seed storage grain pest. **[5]**

b) Discuss factors affecting seed dormancy. **[5]**

Q8) a) Give an account of production and maintenance of breeder's seed in self pollinated crops. **[5]**

b) Write note on ISTA. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2160

[Total No. of Pages : 2

[5329]-312
M.Sc. - II
BOTANY
BO - 3.50 : Advanced Biodiversity
(2013 Pattern) (Semester - III) (Credit System) (New)

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) Discuss Gymnosperm diversity w.r.t. species habit and habitat. **[4]**

b) Explain in brief Grassland and Tropical Forest Ecosystem. **[4]**

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

Q2) a) Describe lichen diversity wrt habitat and distribution. **[4]**

b) Write an alpha and beta diversity. **[4]**

c) Give scope and importance of biodiversity. **[2]**

Q3) a) Discuss Endemism and biodiversity giving examples. **[4]**

b) Comment on different sampling techniques for monitoring of plant and insect diversity. **[4]**

c) State the common features of threatened species. **[2]**

Q4) a) Explain the role of National parks as a method of insite conservation. **[4]**

b) Write a note on Chipko Movement. **[4]**

c) What are pollen banks? **[2]**

P.T.O.

Q5) a) Explain species richness and species abundance. **[5]**

b) Mention aesthetic values of biodiversity and its use as fodder. **[5]**

Q6) a) Comment on global distribution of biodiversity. **[5]**

b) Explain the role of biotechnology in conservation and utilization. **[5]**

Q7) a) State the methods of assessing and measuring biodiversity. **[5]**

b) Discuss metapopulation concept. **[5]**

Q8) a) Explain factors affecting species distribution. **[5]**

b) Comment on indirect adverse impact of biotechnology on biodiversity. **[5]**

⌘⌘⌘

Total No. of Questions :8]

SEAT No. :

P2161

[Total No. of Pages : 2

[5329]-401
M.Sc.-II
BOTANY
BO-4.1 : Computational Botany
(2013 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Compute mean, median and mode of following data. **[4]**

13.2, 15.4, 14.4, 15.0, 16.6, 13.2, 16.0, 17.2, 16.2, 16.6, 14.4

b) Draw a scatterred diagram of following data and write your conclusion. **[4]**

Temp.	15	17	19	20	22	23	25	26	30	35
No. of seeds germinated	10	15	18	19	21	20	22	24	28	34

c) What is Ions and electrical potentials. **[2]**

Q2) a) Explain BLAST and give its significance. **[4]**

b) Comment on dynamic programming algorithms. **[4]**

c) Describe the procedure for preparation of Buffers. **[2]**

Q3) a) Comment on EMBEL and NCBI. **[4]**

b) Distinguish between Refseq and gene bank. **[4]**

c) State principle of spectrophotometry. **[2]**

Q4) a) Give guidelines for designing the experiment w.r.t. size of plot and number of replication. **[4]**

b) Explain Dunnet's test for comparison of treatment means with control. **[4]**

c) What is gene duplication and divergenes? **[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 of the following table give no. 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	25	32	17	23	15	39	27	19	22	26

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

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

Q6) a) Explain the concept of Skewness & Kurtosis. **[5]**

b) Describe Merst and Goldmen equation. **[5]**

Q7) a) Explain multiple sequence alignment in sequence similarities. **[5]**

b) Describe Randomized Block Design (RBD). **[5]**

Q8) a) Explain different methods of sampling. **[5]**

b) Describe the procedure for FASTA. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2162

[Total No. of Pages : 2

[5329]-402

M.Sc.

BOTANY

BO - 4.2 : Plant - Organism Interaction

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

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

Instructions to the candidates:

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

Q1) a) Comment on competitive mechanisms in plants. **[4]**

b) Discuss endotrophic mycorrhiza. **[4]**

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

Q2) a) Explain endophytic fingal association. **[4]**

b) Describe any two parasitic plant association. **[4]**

c) Write any two examples if insect - fungal interactions. **[2]**

Q3) a) Discuss different aspects of seed dispersal. **[4]**

b) Comment on any two insectivorous plants. **[4]**

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

Q4) a) Comment on butterflies and birds as pollinators. **[4]**

b) Write on grazing animals plant interactions. **[4]**

c) How mammals act as pollinators? **[2]**

P.T.O.

Q5) a) Describe algae - fungi association. **[5]**

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

Q6) a) Write on nodulation. **[5]**

b) Explain algae - coral interactions. **[5]**

Q7) a) State contrivances for cross pollination. **[5]**

b) How genetic engineering techniques is useful for improved tolerance against herbivored. **[5]**

Q8) a) Comment on coevolution of pollinators and plants. **[5]**

b) Describe how flowers have modified for self pollination. **[5]**

Total No. of Questions : 8]

SEAT No : ____

P 2163

[Total No. of Pages :2

[5329]-403
M.Sc. - II
BOTANY
BO - 4.3 : Industrial Botany - II
(2013 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Give an account of micropropagation of Banana. **[4]**

b) Comment on medicinal mushrooms for healthy life. **[4]**

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

Q2) a) Comment on biological factors affecting fruit deterioration. **[4]**

b) Discuss different styles of gardening. **[4]**

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

Q3) a) Comment on medicinal herbs used for hair dyes & cosmetics. **[4]**

b) Give an account on international trade in tropical & sub-tropical fruits. **[4]**

c) Enlist the methods of prolongation of vase life of flowers. **[2]**

Q4) a) Give methods of acclimatization of tissue culture raised plants. **[4]**

b) Prepare a landscaping plan for educational institute. **[4]**

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

P.T.O.

Q5) a) Give an account of value addition to biodiversity through chemoprospection. **[5]**

b) Comment on factors affecting flower production. **[5]**

Q6) a) Describe the protocol for Orchid micropropagation. **[5]**

b) Briefly write on forest Botany. **[5]**

Q7) a) Discuss world fruit production & contribution to GDP. **[5]**

b) Prepare bankable techno-commercial report for micropropagation of Lilium. **[5]**

Q8) a) Give the principles of diversity in fruit characteristics. **[5]**

b) Describe medicinal plants mentioned in Atharvaveda with their applications. **[5]**

Total No. of Questions : 8]

SEAT No : ____

P 2164

[Total No. of Pages :2

[5329]-404
M.Sc. - II
BOTANY
BO - 4.4 : Plant Pathology
(2013 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

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

Q1) a) What is the effect of pathogen on respiration of the host? **[4]**

b) Give an account of effect of temperature on disease development. **[4]**

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

Q2) a) Explain the use of biocontrol agents in controlling diseases. **[4]**

b) Comment on nematodal diseases in plants. **[4]**

c) Draw stages of development of disease cycle. **[2]**

Q3) a) Give an account of horizontal resistance in plants. **[4]**

b) What is the role of chemical activators of resistance in controlling plant diseases? **[4]**

c) Give the concept of physiological specialization. **[2]**

Q4) a) How pathogenic enzymes break the cellulose from host? **[4]**

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

c) Define fungicides with two examples. **[2]**

P.T.O.

Q5) a) Explain the concept of plant disease epidemology. **[5]**

b) Write an account of host specific toxins with two examples. **[5]**

Q6) a) Enlist the genes and their mode of action in host-pathogen interaction. **[5]**

b) Comment on the classification of diseases. **[5]**

Q7) a) Describe biotrophs with a suitable example. **[5]**

b) Give an account of plant disease assessment. **[5]**

Q8) a) What are post harvest diseases of vegetables? **[5]**

b) Comment on use of breeding methods to improve resistance of the plants. **[5]**