Total No. of Questions : 8]

SEAT No. :

P2853

[Total No. of Pages :2

[4732] - 1001
M.Sc. -I
BOTANY
BO-1.1: Cryptogamic Botany - I
(2013 Pattern) (Semester - I) (Credit System)

Time : 3Hours] *[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) Draw and describe external and internal characters of gametophyte of Targionia. **[4]**

b) Sketch and label T.S. of Equisetum stem. **[3]**

c) Give economic importance of pteridophytes. **[3]**

Q2) a) Describe sporophyte of Isoetes. **[4]**

b) Give an account of economic 'importance of Bryophyta'. **[3]**

c) Draw and describe mature antheridia in Riccia. **[3]**

Q3) a) Describe vegetative reproduction in Bryophyta. **[4]**

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

c) Draw and describe internal structure of leaf of polytrichum. **[3]**

Q4) a) Draw and describe L.S. of sporophyte of Anthocerotales. **[5]**

b) Give an account of stelar evolution in Pteridophyta. **[5]**

P.T.O.

Q5) a) Give an outline classification of pteridophyta proposed by sporne system. **[4]**

b) Draw and describe internal structure of Hepaticopsida. **[4]**

c) Enlist types of sporophyte of pteridophytes. **[2]**

Q6) a) Comment on Metzeriales. **[4]**

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

c) Differentiate between sterile and fertile branches of Equisetum. **[2]**

Q7) a) Comment on Lepidocarpon. **[4]**

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

c) What is comma? Explain. **[2]**

Q8) a) Explain any one theory of evolution of sporophyte of Bryophyta. **[5]**

b) Give an account of morphology and anatomy of gametophyte of order marsileales. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2854

[Total No. of Pages :2

[4732] - 1002
M.Sc.
BOTANY
BO - 1.2 : Plant Physiology & Biochemistry
(Credit System) (Semester - I) (New) (2013 Pattern)

Time : 3Hours] *[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 about enzyme kinetics. **[4]**

b) How active transport occur in plants? **[3]**

c) Write the types of nucleotides. Give the difference between RNA & DNA. **[3]**

Q2) a) Give an account on lipid biosynthesis. **[4]**

b) Write a note on dissociation & association constant. **[3]**

c) What is temperature stress & How it affects the plants? **[3]**

Q3) a) What is meant by diffusion? Write a note on channels & their role in transport process. **[4]**

b) Explain structural hierarchy in proteins. **[3]**

c) Write a note on phytochromes. Discuss their structure & function. **[3]**

Q4) a) Write a note on metabolic pathways of phenolics. **[5]**

b) Discuss regulation of Calvin cycle. **[5]**

P.T.O.

Q5) a) What type of metabolic changes occur during flower initiation. **[4]**

b) Write principles & working of capacitance meter. **[4]**

c) What are the types of carbohydrates. **[2]**

Q6) a) What is a NOD factor? Explain its role in nitrogen fixation. **[4]**

b) Write the Factors affecting enzyme activity. **[4]**

c) How ATPs are synthesized? **[2]**

Q7) a) Discuss signal transduction process in guardcells. **[4]**

b) What are brassinosteroids? Give any two effects of them on plants. **[4]**

c) Comment on activation energy. **[2]**

Q8) a) Write a note on mitochondrial ETS. **[5]**

b) What are the types of amino acids & proteins? **[5]**

Total No. of Questions : 8]

SEAT No. :

P2855

[Total No. of Pages : 2

[4732] - 1003
M.Sc. (Botany)
BO-1.3: GENETICS & PLANT BREEDING
(2013 Pattern) (Credit System) (Semester - I)

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

Instructions to the candidates:

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

Q1) a) Explain Hardy-Weinberg law of gene & gene Frequencies. **[4]**

b) Write importance of Genetic Markers. **[3]**

c) Explain the mechanism of point mutagenesis. **[3]**

Q2) a) Explain the mechanism of transformation in Bacteria. **[4]**

b) Write the concept of Karyotype. **[3]**

c) Give classification of polyploids. **[3]**

Q3) a) Describe lyfic & Lysogenic cycles in phages. **[4]**

b) Explain the phenomenon of Robert sonian. **[3]**

c) Explain the characters of multiple allele. **[3]**

Q4) a) Describe conjugation method of genetic transfer in bacteria. **[5]**

b) Explain the inheritance of mitochondrial gene in petite yeast. **[5]**

P.T.O.

Q5) a) Explain homologus & non-homologous recombination. **[4]**

b) Describe inheritance of quantitative traits in Zea mays. **[4]**

c) Describe role of Hybridization in plant breeding. **[2]**

Q6) a) Explain pre and post Mendelian development in plant breeding. **[4]**

b) Comment on phage mutants. **[4]**

c) Give the role of polyploidy in plant breeding. **[2]**

Q7) a) Give importance of genetic diversity in crop improvement. **[4]**

b) Describe the Role of chemical mutagens in mutation breeding. **[4]**

c) Write an account on Asexual reproduction. **[2]**

Q8) a) Explain the mechanism of tetrad analysis in ordered tetrad. **[5]**

b) Enlist types of chromosome banding with their importance. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2856

[Total No. of Pages : 2

[4732] - 1004
M.Sc.
BOTANY
BO - 1.4 : Botanical Techniques
(2013 Pattern) (Credit System) (Semester - I)

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

Instructions to the candidates:

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

Q1) a) Explain the principle and working of oxygen electrode. **[4]**

b) Explain molar extinction coefficient. **[3]**

c) Application of Gel Filtration chromatography. **[3]**

Q2) a) Comment on safety handling of radio isotopes. **[4]**

b) Write note on Antigen - antibody intereaction. **[3]**

c) Explain Camera lucida technique. **[3]**

Q3) a) Explain working of fluroscence microscopy. **[4]**

b) State working principle of flow cytometry. **[3]**

c) Enlist properties of light. **[3]**

Q4) a) What is PCR? Explain various steps involved in PCR. **[5]**

b) State principle and working of IR spectroscopy. **[5]**

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

b) Explain 2-Dimensional gel electrophoresis Technique. **[4]**

c) Define partition coefficient. **[2]**

P.T.O.

Q6) a) Explain X-ray crystallography technique. **[4]**

b) State principle of NMR Spectroscopy. **[4]**

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

Q7) a) Describe HPLC technique in detail. **[4]**

b) State working principle of Fluorescence microscopy. **[4]**

c) Comment on multiple staining technique. **[2]**

Q8) a) Describe DNA microarray technique. **[5]**

b) State principle and working of Atomic absorption Spectroscopy. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2857

[Total No. of Pages : 2

[4732] - 2001
M.Sc.
BO-2.1:BOTANY
Cryptogamic Botany - II
(2013 Course) (Semester - II) (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) Comment on life cycle pattern of Rhodophyta. **[4]**

b) Write note on sex hormones in fungi: **[3]**

c) What are mycorrhizae? Briefly write on its significance. **[3]**

Q2) a) Give distinguishing characters of Deuteromycotina. **[4]**

b) Write note on anatomy of lichen thallus. **[3]**

c) Briefly comment on contribution of any two mycologists from India. **[3]**

Q3) a) Give distinguishing characters of Chlorophyta. **[4]**

b) Write thallus organization in chroococcales. **[3]**

c) Mention economic aspects of algae. **[3]**

Q4) a) Give an detail account of photosynthetic pigments and reserve food in algae. **[5]**

b) Write on sources of data for plant systematics. **[5]**

P.T.O.

Q5) a) Give distinguishing characters and thallus structure in Euglenophyta. **[4]**

b) Comment on life cycle pattern in Hemiascomycetes. **[4]**

c) Write contribution of any one Indian Phycologist. **[2]**

Q6) a) Discuss types and structure of basidia. **[4]**

b) Comment on habit and habitat of Bacillariophyta. **[4]**

c) Write on damage caused by smut fungi. **[2]**

Q7) a) Discuss life cycle pattern in chytridiomycetes. **[4]**

b) Write on sexual reproduction in Zygomycotina. **[4]**

c) Sketch and lable the typical fungal cell. **[2]**

Q8) a) Give an account of classification of fungi as proposed by Ainsworth et al. (1973). **[5]**

b) Comment on fungal nutrition. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2858

[Total No. of Pages : 2

[4732]-2002
M.Sc.
BOTANY
BO-2.2 : Cell Biology and Evolution
(2013 Pattern) (Semester-II) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Describe various modes of transport across membranes. **[4]**

b) Enlist electrical properties of membranes. **[3]**

c) State cell theory. **[3]**

Q2) a) Comment on "programmed cell death-a molecular aspect". **[4]**

b) Write note on cell cycle labelled mitotic curve. **[3]**

c) Describe evolution of unicellular eukaryotes. **[3]**

Q3) a) Explain ultra structure of lysosomes, membrane integrity and its role. **[4]**

b) Write note on transport across vacuolar membrane. **[3]**

c) Comment on "Transport of ions and solutes. **[3]**

Q4) a) What is cell cycle? Explain mechanisom of regulation of cell cycle. **[5]**

b) Explain Hardy-Weinberg law, with suitable example. **[5]**

P.T.O.

Q5) a) Give an account of migration and genetic drift. **[4]**

b) Comment on "Threonine Kinose". **[4]**

c) Explain parapotric speciation. **[2]**

Q6) a) Explain transport across nuclear membrane. **[4]**

b) Comment on "Mechanisom of sorting and regulation of intracellular transport. **[4]**

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

Q7) a) Explain diversity in phosphatase. **[4]**

b) Write note on Regulation of cell death. **[4]**

c) Enlist function of mitochondria. **[2]**

Q8) a) Explain the role of cyclins and protein Kinase in cell cycle. **[5]**

b) What is molecular evolution? Describe molecular tool in phylogeny. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2859

[Total No. of Pages : 2

[4732]-2003
M.Sc.
BOTANY
BO-2.3 : Molecular Biology & Genetic Engineering
(2013 Pattern) (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 diagrams must be drawn wherever necessary.***

Q1) a) What is C-value? Explain about C-value paradox. **[4]**

b) Discuss about DNA replication in prokaryotes. **[3]**

c) Write on exonucleases & their application in genetic engineering. **[3]**

Q2) a) Give an account on DNA damage & their types. **[4]**

b) Explain reverse transcriptase & their role. **[3]**

c) Comment on hypochromicity & hyperchromicity. **[3]**

Q3) a) Discuss any two methods of blotting. **[4]**

b) How C-DNA is prepared? **[3]**

c) Write a note on selection of recombinants. **[3]**

Q4) a) What are chaperones? Write their role. **[5]**

b) How transformants should be handled in subsequent generations? **[5]**

P.T.O.

Q5) a) Write a note on BACs. **[4]**

b) Give an account on 'rolling circle' & theta model. **[4]**

c) Explain about 'Exons'. **[2]**

Q6) a) How RNA processing occur in eukaryotes. **[4]**

b) Write on the 'vectors' used for marker free selection. **[4]**

c) Explain - topoisomerases. **[2]**

Q7) a) How recombinant DNA molecule is constructed? **[4]**

b) Write about direct gene transfer methods in plant. **[4]**

c) What are transcription factors? **[2]**

Q8) a) Discuss the structure & role of promoters & terminators. **[5]**

b) Give an account on the applications of genetic engineering for abiotic stress tolerance. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2860

[Total No. of Pages : 2

[4732]-2004
M.Sc.
BOTANY
BO-2.4 : Plant Ecology and Phytogeography
(2013 Pattern) (Semester-II) (New) (Credit System)

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

Instructions to the candidates:

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

Q1) a) How plant establishes relationship with light and radiation? **[4]**

b) Discuss the relationship between plant and soil microbes as edaphic factor. **[3]**

c) Comment on the impact of soil and noise pollution. **[3]**

Q2) a) Write a note on water pollution and its impact. **[4]**

b) Discuss centres of origin. **[3]**

c) Comment on water holding capacity of the soil. **[3]**

Q3) a) Discuss Estuarine ecology. **[4]**

b) Comment on the components of Biomes. **[3]**

c) Describe Endemism. **[3]**

Q4) a) Discuss life history with referance to C-S-R triangle. **[5]**

b) Comment on community structure. **[5]**

P.T.O.

Q5) a) Describe the forest ecosystem with suitable examples. **[4]**

b) Discuss Autogenic plant succession. **[4]**

c) What is ecosystem organization? **[2]**

Q6) a) Discuss plant adaptive responses to variation with respect to water availability. **[4]**

b) Write a note on mechanism and phases of plant succession. **[4]**

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

Q7) a) Discuss the types of plant diversity with referance to ecotone and edge effect. **[4]**

b) Define extinction. Add a note on extinction events. **[4]**

c) What is population ecology? **[2]**

Q8) a) Write note on floristic regions of India. **[5]**

b) Comment on habitat ecology with respect to dessert ecology. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2861

[Total No. of Pages :2

[4732] - 3001
M.Sc. -II
BOTANY
BO-3.1: Spermatophytic Botany
(2013 Pattern) (Semester - III) (Credit System)

Time : 3Hours] *[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 the general characters of cordaitales. **[4]**

b) Comment an gametophyte of Gnetales. **[3]**

c) Give merits and Demerits of Dahlgren system of classification. **[3]**

Q2) a) Write shortly cordaites. **[4]**

b) Give systematic position of family lauraceae. **[3]**

c) Write an phenetic verses phylogenetic systems. **[3]**

Q3) a) Explain general characters of coniferales. **[4]**

b) Write an cycadeoidea. **[3]**

c) Comment an invasions and Introductions. **[3]**

Q4) a) Describe pentoxylates. **[5]**

b) Give any two pre-Darwinian classification systems. **[5]**

P.T.O.

Q5) a) Comment an morphology of plant body of Ginkgoales. **[4]**

b) Comment an Alpha and omega Taxonomy. **[4]**

c) Enlist importance of systematics. **[2]**

Q6) a) Write a note on APG. **[4]**

b) Comment an Hotspots. **[4]**

c) Give any four affinities of Gymnosperms with Angiosperms. **[2]**

Q7) a) Comment an Welwitschia. **[4]**

b) Comment an provisions for the governance of the ICBN code. **[4]**

c) Give economic Importance of family Alismataceae. **[2]**

Q8) a) Comment an morphology of sparophytes of cycadales. **[5]**

b) Discuss morphological variations of the family Hydrocharitaceae. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2862

[Total No. of Pages :2

[4732] - 3002
M.Sc. (Part - II)
BOTANY
BO - 3.2 : Developmental and Economic Botany
(2013 Pattern) (Credit System) (Semester - III)

Time : 3Hours] *[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 polarity and symmetry. **[4]**

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

c) What is totipotency. **[3]**

Q2) a) Describe vegetative to reproductive phase of transition. **[4]**

b) Describe seedling development at molecular level. **[3]**

c) Give source and economic use of barley and finger millet. **[3]**

Q3) a) Describe gene expression during flowering. **[4]**

b) Give source and cultivation method of turmeric and saffron. **[3]**

c) Comment on meristems as a dynamic centers of cell regeneration. **[3]**

Q4) a) Describe categories of apomixis. **[5]**

b) Comment on intrinsic factors for plant development. **[5]**

P.T.O.

Q5) a) Write morphological and histochemical changes in transition. **[4]**

b) Give source and economic use of camphor oil and sarson oil. **[4]**

c) Comment on cell growth. **[2]**

Q6) a) Describe apomictic polyembryony. **[4]**

b) Explain anther culture. **[4]**

c) Write source and any two economic uses of coffee and strawbery. **[2]**

Q7) a) Comment on pullen and protoplast culture. **[4]**

b) Give source and cultivation method of cauliflower and banana. **[4]**

c) Define plant development. Comment on its concept. **[2]**

Q8) a) Give an account of seed germination. **[5]**

b) Describe gametic fusion and significance of double fertilization. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2863

[Total No. of Pages : 2

[4732] - 3003
M.Sc. - II (Botany)
BO-3.3: INDUSTRIAL BOTANY - I
(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) Comment on algae as a resource for fuel biofertilizer and neutraceuticals. **[4]**

b) Describe bioethanol production process from cellulose. **[3]**

c) Write note on ''Animal fat as source for biodiesel production''. **[3]**

Q2) a) Justify ''Biodiesel as alternative for fossil fuel''. **[4]**

b) Explain oil extraction methods. **[3]**

c) Write note on pyrethrins. **[3]**

Q3) a) Write note on economy of lipid biofuel. **[4]**

b) Give an account of economically important algae. **[3]**

c) State properties of lipid biofuel. **[3]**

Q4) a) Explain contineous fermentation process. **[5]**

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

P.T.O.

Q5) a) Describe the production process of fungal food. **[4]**

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

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

Q6) a) What is enterpreneur? Give the types and function of enterpreneur. **[4]**

b) Describe the production process of cepholosporins. **[4]**

c) What is role of Industrial estate. **[2]**

Q7) a) Give an account of human resource management. **[4]**

b) Write note on commerce and trade. **[4]**

c) What you mean by aseptic operation. **[2]**

Q8) a) What is algal technology? Add note on commercial utility of algae. **[5]**

b) Explain isolation, and mass multiplication technique of Trichoderma. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2864

[Total No. of Pages : 2

[4732] - 3004

M.Sc.

BOTANY

BO - 3.41 : Advanced Mycology and Plant Pathology

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

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

Instructions to the candidates:

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

Q1) a) Give an account of Bessey's system of classification of fungi. **[4]**

b) How Fungi are ideal organism for genetical studies? **[3]**

c) Write contribution of Anton de Bary. **[3]**

Q2) a) Explain ecological groups of Fungi. **[4]**

b) Write affinities of fungi with plants and animals. **[3]**

c) Describe asexual spores in Fungi. **[3]**

Q3) a) Comment on plasmodiophoromycota. **[4]**

b) Write on Labyrinthulomycota. **[3]**

c) What are straminipila? **[3]**

Q4) a) Give characters of Oomycota and add a note on peronosporales. **[5]**

b) Explain Acrasiomycetes and Protosteliomycetes. **[5]**

Q5) a) What are Zygomycetes? Comment on evolution and conidium in Mucorales. **[4]**

b) Mention salient characters of Gasteromycetes. Comment on structure of fruit bodies. **[4]**

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

P.T.O.

Q6) a) What are Loculoascomycetes? Add a note on ascostromatic ascocarp. **[4]**

b) Comment on different types of rusts with examples. **[4]**

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

Q7) a) What are anamorphic Fungi? Comment on conidiomata. **[4]**

b) Write on ruderal and stress tolerant Fungi. **[4]**

c) Give difference between intermediate and systemic mycosis. **[2]**

Q8) a) What is dermatomycosis? Write on symptoms and clinical aspects. **[5]**

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

Total No. of Questions : 8]

SEAT No. :

P2865

[Total No. of Pages : 2

[4732] - 3005
M.Sc. (Part - II)
BOTANY
BO - 3.42 : Advanced Angiosperms
(Semester - III) (Credit System) (2013 Pattern)

Time : 3Hours] *[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 systematic position, interrelationships and economic importance of family Asteraceae. **[5]**

b) Describe the role of chromosome number, polyploidy and aneuploidy in systematics of Angiosperms. **[5]**

Q2) a) Describe the exine stratification in pollen grain. Add a note on NPC system. **[5]**

b) Discuss the various techniques of protein electrophoresis. **[5]**

Q3) a) Explain the role of amino acid sequence and its significance in Angiosperm systematics. **[4]**

b) What is RAPD? Write a note on PCR analysis. **[3]**

c) Write an account of applications of serological data in systematics. **[3]**

Q4) a) Give systematic position, interrelationships, phylogeny and economic importance of Dioscoriaceae. **[4]**

b) Floral architecture in Orchids. **[3]**

c) Significance of chromosome banding in angiosperm systematics. **[3]**

P.T.O.

Q5) a) Discuss the evolution of angiosperms with reference to anatomy of wood. **[4]**

b) Explain the importance of meiotic analysis in plant systematics. **[3]**

c) Write note on L/O pattern. **[3]**

Q6) a) Give importance of SEM and TEM studied in plant systematics. **[4]**

b) Describe phytogeographical regions of India in brief. **[4]**

c) Systematic position of Trapa. **[2]**

Q7) a) Discuss - "Centrospermae as a natural taxon". **[4]**

b) Describe various classes of chemical compounds and their biological significance in chemotaxonomy. **[4]**

c) Systematic position of Paeoniaceae. **[2]**

Q8) a) Discuss systematic position of Parietales with reference to pollen characters. **[4]**

b) Describe floral structure and evolutionary significance in pandanaceae. **[4]**

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

Total No. of Questions : 8]

SEAT No. :

P2866

[Total No. of Pages : 2

[4732] - 3006
M.Sc. - II
BOTANY
BO - 3.43 : Advanced Plant Physiology
(2013 Pattern) (Semester - III) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Describe the role of mycorrhizal fungi in uptake of nutrients by roots. **[4]**

b) Explain any one factor influence transport of water. **[3]**

c) Give role of transporters. **[3]**

Q2) a) Explain how soil pH influence the availability of mineral nutrients. **[4]**

b) Comment on role of PPase. **[3]**

c) Give disadvantages of conventional methods of application of fertilizers. **[3]**

Q3) a) Comment on photosynthetic ETS in prokaryotic organisms. **[4]**

b) Give role of PEP case. **[3]**

c) Explain Schematically CAM pathway. **[3]**

Q4) a) Comment on significance of C_3 and C_4 intermediate pathway. **[5]**

b) Explain feedback regulation of photosynthesis. **[5]**

Q5) a) Explain role of alternate oxidase. **[4]**

b) Comment on respiration in response to anoxia. **[4]**

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

P.T.O.

Q6) a) Explain schematically the major pathways of secondary metabolite biosynthesis. **[5]**

b) Comment on diverse nature of mitochondrial ETS. **[5]**

Q7) a) What is growth? Comment on net assimilation rate. **[4]**

b) Explain what is circadian rhythm? **[4]**

c) Give role of compatible solutes. **[2]**

Q8) a) Explain with suitable examples the improvement of any one physiological trait in crop plants. **[4]**

b) Comment on role of light and dark period in induction of flowering. **[4]**

c) Give role of any one synthetic auxin in agriculture. **[2]**

Total No. of Questions : 8]

SEAT No. :

P2867

[Total No. of Pages : 2

[4732] - 3007

M.Sc.

BOTANY

BO - 3.44 : Advanced Genetics & Molecular Biology

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

Time : 3Hours] *[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) Give general characteristics & mechanism of transposons. **[4]**

b) Describe mechanism of plasmid DNA replication. **[3]**

c) Comment on premature lysis experiment. **[3]**

Q2) a) Describe AC and DC elements in maize. **[4]**

b) Write an account of genome size & evolutionary complexity. **[3]**

c) Give broad host range of plasmid. **[3]**

Q3) a) Describe polytene chromosome. **[4]**

b) Comment on morphogenesis & maturation of T_4 bacteriophage. **[3]**

c) Give importance of transposable element in Drosophila. **[3]**

Q4) a) Describe arrangement of chromatin fibers in a chromosomes. **[5]**

b) Explain nature of interaction between plasmid & host. **[5]**

Q5) a) Write an account on classification & characterization of gluten protein genes. **[4]**

b) Explain Hardy-Weinberg principle of gene Frequencies. **[4]**

c) Give the mechanism of circular chromosome segregation. **[2]**

P.T.O.

Q6) a) Describe the structure of high molecular weight subunit genes. **[4]**

b) Give the method of DNA polymorphisms with their applications. **[4]**

c) Write phage Mu transposition. **[2]**

Q7) a) Comment on DNA typing & population substructure. **[4]**

b) Explain single site-specific recombination. **[4]**

c) Write on Gene silencing. **[2]**

Q8) a) Describe methods of direct detection of gene mutation. **[5]**

b) Explain the mechanism of genome mapping. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2868

[Total No. of Pages : 2

[4732] - 3008
M.Sc.
BOTANY
BO - 3.45 : Advanced Plant Biotechnology
(2013 Pattern) (Credit System) (Semester - III)

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

Instructions to the candidates:

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

Q1) a) Explain the role of transgenics for reducing post harvest losses of fruits and flowers. **[4]**

b) Enlist any three genes with their use in obtaining virus resistant transgenic plants. **[3]**

c) State any three nutrient media components and their manipulation for obtaining enhanced secondary metabolite production. **[3]**

Q2) a) Discuss applications of PCR technique. **[4]**

b) Explain parameters of growth analysis for secondary metabolite production. **[3]**

c) Enlist any three genes with suitable examples for obtaining salt stress resistance. **[3]**

Q3) a) Explain the types of tissue culture systems used for secondary metabolite production. **[4]**

b) Discuss the concept of promoter and enhancer traps. **[3]**

c) Write a note on 'Knock out mutants'. **[3]**

Q4) a) Describe any one method of DNA sequencing. **[5]**

b) Explain any one method of alteration in gene expression. **[5]**

P.T.O.

Q5) a) Enlist three genes with suitable transgenic examples for obtaining herbicide resistance. **[4]**

b) Explain the use of phage vectors in gene cloning. **[3]**

c) What are restriction endonucleases? Enlist any three examples of restriction endonucleases. **[3]**

Q6) a) Name the gene and successful example of insect resistant plant. **[4]**

b) Write the use of antisense technology in gene silencing. **[3]**

c) Write a short note on 'Applications of southern blotting'. **[3]**

Q7) a) Explain the strategies to obtain disease resistant transgenic plants. **[4]**

b) Explain any one technique used in improving secondary metabolite production in culture. **[3]**

c) What is insertional mutagenesis? Enlist its uses in altering gene expression. **[3]**

Q8) a) Explain method of in vivo gene cloning with the help of any two vectors. **[5]**

b) Explain the methods of PCR. Add a note on applications of PCR. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2869

[Total No. of Pages : 2

[4732] - 3009
M.Sc.
BOTANY
BO - 3.46 : Advanced Medicinal Botany
(New) (2013 Pattern) (Semester - III) (Credit System)

Time : 3Hours] *[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 plants of India. **[4]**

b) Comment on cultivation, collection and processing of any one herbal drug. **[3]**

c) Write a note on scope of pharmacognosy. **[3]**

Q2) a) Comment on physical and Biological methods of drug evaluation. **[4]**

b) Discuss a case study of any one Ayurvedic drug. **[3]**

c) Write a note on biogenesis of phytopharmaceuticals. **[3]**

Q3) a) Comment on Marine drugs. **[4]**

b) Write on Ayurvedic profile of Amla. **[3]**

c) Describe pyrethrum as natural pesticide. **[3]**

Q4) a) Give detailed account on source, cultivation and collection of Aloes and Dioscorea. **[5]**

b) Give Macroscopic characters of Brahmi and Henna. **[5]**

Q5) a) Comment on alternative system of medicine. **[4]**

b) Write a note on Indian trade in medicinal and aromatic plants. **[4]**

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

P.T.O.

Q6) a) Comment on morphological and chemical method of drug evaluation. **[4]**

b) Give the importance of plant tissue culture for phytopharmaceuticals. **[4]**

c) What is quality control? **[2]**

Q7) a) Write in details about phytopharmaceutical prospects. **[4]**

b) Discuss cosmeceuticals. **[4]**

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

Q8) a) Give applications of Camphor and Eucalyptus. **[5]**

b) Write a note on papain and Belladona. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2870

[Total No. of Pages : 2

[4732] - 3011

M.Sc.

BOTANY

BO - 3.48 : Advanced Seed Technology

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

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

Instructions to the candidates:

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

Q1) a) Comment on important seed industries in India. **[4]**

b) What are gametocides? Explain their role in seed production. **[3]**

c) Write a note on self incompatability. **[3]**

Q2) a) Explain Factors affecting seed germination. **[4]**

b) Comment on classes of seeds. **[3]**

c) Explain embryo development in dicot seed. **[3]**

Q3) a) Comment on ELISA test. **[4]**

b) Give an account of entry point and mechanism of seed transmission. **[3]**

c) Comment on constructional Features for good seed warehouse. **[3]**

Q4) a) Write note on RFLP and RAPD. **[5]**

b) Comment on integrated management of seed borne diseases. **[5]**

Q5) a) Explain Floral biology and mode of pollination inself pollinated crops. **[4]**

b) Give brief account of seed production in tomato. **[2]**

c) Define seed dormancy. **[4]**

P.T.O.

Q6) a) Comment on packaging and handling of seeds. **[4]**

b) Give brief account of seed production in onion. **[4]**

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

Q7) a) Explain in detail any two germination tests. **[4]**

b) Comment on artificial seeds. **[4]**

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

Q8) a) Give an account of general procedure for seed certification. **[5]**

b) Comment on quarantine for seed. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2871

[Total No. of Pages : 2

[4732] - 3013
M.Sc. - II
BOTANY
BO - 3.50 : Advanced Biodiversity
(2013 Pattern) (Credit System) (Special Paper - I) (Semester - III)

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

Instructions to the candidates:

1) ***Answer any Five questions.***
2) ***All Questions carry equal marks.***
3) ***Neat diagram must be drawn wherever necessary.***

Q1) a) Describe algal biodiversity w.r.t. species, habit, habitat and distribution at taxonomic level. **[4]**

b) Explain scope and importance of biodiversity. **[3]**

c) Describe nature and origin of genetic variations. **[3]**

Q2) a) Comment on gymnosperm diversity w.r.t. habit, habitat and evolutionary success at taxonomic level. **[4]**

b) Write in brief about species richness and species abundance. **[3]**

c) Give a brief account of Peri-urban diversity. **[3]**

Q3) a) Describe Global distribution of biodiversity. **[4]**

b) Give sampling techniques for monitoring of insect biodiversity. **[3]**

c) Give the common features of threatened species. **[3]**

Q4) a) Explain in detail Endemic biodiversity. **[5]**

b) Explain factors affects genetic diversity. **[5]**

Q5) a) Comment on role of biosphere reserves in insitu conservation. **[4]**

b) Chipko movement. **[4]**

c) Comment on conservation of species diversity. **[2]**

P.T.O.

Q6) a) Describe any two methods of ex-situ conservation. **[4]**

b) Explain sacred groves and sthalavrikshas. **[4]**

c) Write a brief note on ecosystem restoration. **[2]**

Q7) a) Give an account on ethical values of biodiversity and use of biodiversity in food. **[4]**

b) Describe abundance of species in different ecosystems of the world. **[4]**

c) What is the role of biotechnology in conservation of biodiversity. **[2]**

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

b) Explain the role of biotechnology in assessment of biodiversity and bioresources. **[5]**

Total No. of Questions : 8]

SEAT No. :

P2872

[Total No. of Pages : 3

[4732] - 4001
M.Sc. -II
BOTANY
BO-4.1: Computational Botany
(2013 Course) (Credit System) (New) (Semester -IV)

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

Instructions to the candidates:

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

Q1) a) Following are the weight (in kg) of Brinjal fruit from 11 plants.

13.2,15.4,14.4,15.0,16.6,13.2,16,17.2,16.2,16.6,14.4.

Compute mean, median and mode.

b) Draw a scattered diagram of following data and write your conclusion.

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

c) Comment on Enzyme activity.

Q2) a) Comment on EMBEL and NCBI.

b) Distinguish between RefSeq and Gene bank.

c) What is primary and secondary database?

Q3) a) Explain Nerst's and Goldman Equations.

b) How many grams of solid NaOH are required to prepare 500ml of 0.04M solution? Express the concentration of the solution in terms of normality (N) and percent (W/V).

c) What is Normality?

P.T.O.

Q4) a) Write Fisher's basic principles for good experimental design.

b) Explain Tukey's test for pairwise comparisian of treatment.

c) Write an critical difference.

Q5) a) Calculate value of chi-square from the following data

	X_1	X_2	X_3
Y_1	7	8	5
Y_2	8	9	6
Y_3	9	7	8

b) Calculate pearson's coefficient correlations cultivation cost and profit of cotton.

Cultivation cost per acre (in Rs.)	Profit (in Rs) Thousand
390	47
650	53
620	58
900	86
820	62
750	68
250	60
980	91
360	51
780	84

Q6) a) Describe completely randomized design (CDR).

b) What are fields used to search the databases? Give some examples.

Q7) a) Explain the maling of radioisotope solution.

b) Describe procedure in FASTA.

Q8) a) Comment on osmolarity and osmotic pressure.

b) Give the properties of Mean, Median and Mode.

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Total No. of Questions : 8]

SEAT No. :

P2873

[Total No. of Pages : 2

[4732]-4002
M.Sc.-II
BOTANY
BO-4.2 : Plant-Organism Interaction
(2013 Pattern) (Semester-IV) (Credit System)

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

Instructions to the candidates:

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

Q1) a) Comment on symbiotic association in Lichens. **[4]**

b) Give difference between ectomycorrhizae and endomycorrhizae. **[4]**

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

Q2) a) Discuss rhizobia-plant association. **[4]**

b) Explain "Algae-coral association is beautiful symbiosis. **[4]**

c) What is Frankia-plant association? **[2]**

Q3) a) Comment on ambrogel fungi symbiosis. **[4]**

b) Give difference between self and cross pollination. **[4]**

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

Q4) a) Explain humming bird-plant interaction. **[4]**

b) Comment on co-evolution of pollinators as Fig-Fig wasp interaction. **[4]**

c) Briefly comment on fruit morphology and its dispersal method. **[2]**

P.T.O.

Q5) a) Comment on epiphytic plants. **[5]**

b) Discuss the phenomenon of allelopathy with examples. **[5]**

Q6) a) Comment on parasitic association in plants. **[5]**

b) Give different aspects of defence mechanism in plants against herbivores. **[5]**

Q7) a) State different competative mechanism in plants. **[5]**

b) With examples discuss genetic engineering and herbivory. **[5]**

Q8) a) Give an account of carnivory in plants. **[5]**

b) State different aspects of herbivore insect-plant interactions. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2874

[Total No. of Pages : 2

[4732]-4003
M.Sc.-II
BOTANY
BO-4.3 : Industrial Botany-II
(2013 Pattern) (Semester-IV) (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) ***Neat labelled diagrams must be drawn wherever necessary.***

Q1) a) What is explant? Explain various types of explants used in micropropagation. **[4]**

b) Discuss different factors affecting flower production. **[4]**

c) Comment on prospects of herbal technology. **[2]**

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

b) Explain procedure of manufacturing of jams and jellies. **[4]**

c) Write a note on indoor gardening. **[2]**

Q3) a) Enlist medicinal mushrooms and explain their role for healthy life. **[4]**

b) Write about role of Bixa seeds in cotton and silk industry. **[4]**

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

Q4) a) Describe role of medicinal herbs in hair dying and in cosmetics. **[4]**

b) Discuss in brief about landscaping of highways. **[4]**

c) Comment on International trade in tropical fruits. **[2]**

P.T.O.

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

b) Describe role of aromatic plants as source of essence. **[5]**

Q6) a) Write various steps involved in micropropagation of banana. **[5]**

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

Q7) a) Discuss principles of conventional methods of preservation of fruits. **[5]**

b) Write about economics of micropropagation of Gerbera. **[5]**

Q8) a) Explain the role of phyto-technology in value addition to biodiversity through chemo prospection. **[5]**

b) Discuss the significance of forest industries. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P2875

[Total No. of Pages :2

[4732]-4004
M.Sc. -II
BOTANY
BO- 4.4: Plant Pathology
(2013 Pattern) (Credit System) (New) (Semester - IV)

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

Instructions to the candidates:

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

Q1) a) Comment on viral diseases of plants. **[4]**

b) Give an account of pathogenicity of necrotrophs. **[4]**

c) What are post harvest diseases? Give examples. **[2]**

Q2) a) How Fungicides are used in control of plant diseases? **[4]**

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

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

Q3) a) Comment on hypersensitivity defense reaction. **[4]**

b) Give an account of breeding methods for improving resistance in plants. **[4]**

c) Give classificaton of plant diseases on the basis of symptoms. **[2]**

Q4) a) How pathogens affect physiology of host? Explain. **[4]**

b) Explain phytoalexin syntheis. **[4]**

c) What are effecter molecules? **[2]**

P.T.O.

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

b) Comment on nematodal diseases of plants. **[5]**

Q6) a) Write objectives of plant pathology. **[5]**

b) Comment on mode of infection in plant diseases. **[5]**

Q7) a) Give role of biotechnology in plant pathology. **[5]**

b) Explain diagnostic methods for detecting pathogens. **[5]**

Q8) a) Discuss bio-control as a effective procedure for disease control. **[5]**

b) Explain vertical and horizontal resistance in plants. **[5]**

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