Total No. of Questions : 8] **[Total No. of Pages : 2**

P774

[4034] - 101

M.Sc. - I (Sem. - I)

BOTANY

BO - 1.1 : Systematics of Non-Vascular Plants

(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each section.***
2) ***Answer to the TWO sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagram must be drawn WHEREVER necessary.***

SECTION - I

Q1) Give an outline of classification of algae with reasons as proposed by Fritsch. **[16]**

Q2) Describe the vegetative and reproductive structures of order Marchantiales. **[16]**

Q3) Write short answers of the following : **[16]**

a) Give characters of chlorophyta.

b) Comment on heterocysts inter relationship in Cyanophyta.

Q4) Write short notes on any two of the following : **[16]**

a) Biochemical systematics.

b) Sexual reproduction in Rhodophyta.

c) Range of thallus in chlorophyta.

P.T.O.

SECTION - II

Q5) Give an account of thallus structure, spore producing structure and life cycle patterns of any one in Ascomycotina. **[16]**

Q6) Give an outline classification of fungi proposed by G.M. smith and add a note on Biotrophs. **[16]**

Q7) Write short answers of the following : **[16]**

a) Comment on present status of fungi.

b) Write briefly on fungal sex hormones.

Q8) Write short notes on any two of the following : **[16]**

a) Heterothallism,

b) Indian Bryology,

c) Ecological significance of Bryophytes.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P775

[4034] - 102
M.Sc. - I (Sem. - I)
BOTANY
BO - 1.2 : Plant Physiology and Biochemistry
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least TWO questions from each sections.***
2) ***Answer to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Explain the mechanism of generation of electropotential gradient and synthesis of ATP in absence and presence of cyanide in mitochondria.

Q2) Describe schematically the fixation of CO_2 in C_3 plants. Add a note on regulation of RUBISCO activity.

Q3) a) Explain initiation of flowering in plants.

b) What is water potential gradient? Explain facilitated water transport.

Q4) Write short notes on any two of the following :

a) Mechanism of phloem loading.

b) Physiological strategies adapted by plants in abiotic stress tolerance.

c) Biosynthesis of gibberellins (GA).

P.T.O.

SECTION - II

Q5) Explain synthesis and breakdown of glycogen.

Q6) What is enzyme inhibition? Explain competitive and non-competitive enzyme inhibition.

Q7) a) Describe tertiary and quarternary structure of proteins.

b) Explain in brief the process of symbiotic nitrogen fixation.

Q8) Write short notes on any two of the following :

a) β-oxidation,

b) Outline the major pathway of Flavenoid synthesis,

c) Redox potential & free energy.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P776

[4034] - 103
M.Sc. - I (Sem. - I)
BOTANY
BO - 1.3 : Genetics & Plant Breeding
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least TWO questions from each sections.***
2) ***Answer to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Define karyotype with the help of diagrams explain the cytological consequences of crossing over in inversion and translocation heterozygotes. **[16]**

Q2) Define cytoplasmic inheritance. With the help of suitable examples explain chloroplast and mitochondrial inheritance. **[16]**

Q3) Explain in detail of the following : **[16]**

a) Inheritance of quantitative traits.

b) Three point test cross.

Q4) Write notes on <u>any two</u> of the following : **[16]**

a) Hardy-Weinberg Law.

b) Importance of aneuploidy.

c) Molecular basis of gene mutations.

P.T.O.

SECTION - II

Q5) Define polyploidy. How is auto and allopolyploidy induced in plants? Add a note on role of polyploidy in crop improvement. **[16]**

Q6) Define incompatibility. Discuss different types & mechanisms of self incompatibility. **[16]**

Q7) a) Explain in detail heterosis and its applications in plant breeding. **[8]**

b) Explain the genetic basis of plant breeding. **[8]**

Q8) Give brief account of any two of the following : **[16]**

a) Additive interaction of genes.

b) Genetic and physical maps.

c) C-value paradox.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P777

[4034] - 201
M.Sc. (Sem. - II)
BOTANY
BO - 2.1 : Systematics of Vascular Plants
(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Comment on morphological and anatomical features of sporophytes and gametophytes of living Lycopodiales. **[16]**

Q2) a) Mention the peculiar features of the organisation of sporophyte of Ginkgo. **[8]**

b) Comment on peculiarities of the gametophytes of Ginkgoales. **[8]**

Q3) a) Comment on evolutionary significance of heterosporous pteridophytes. **[8]**

b) Describe the organisation of sporophyte of any one conifer. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Alternation of generation in primitive pteridophytes.

b) Sahni's system of classification of Gymnosperms.

c) Gametophyte (female) of Gnetales.

P.T.O.

SECTION - II

Q5) Explain the advantages and limitations of conquest's system of Angiosperm Classification. **[16]**

Q6) a) Distinguish between Magnoliopsida and Liliopsida w.r.t. diagnostic features. **[8]**

b) Explain, with suitable example, the role of palynology in angiosperm systematics. **[8]**

Q7) a) What is a population? Mention the causes of variation between populations. **[8]**

b) Mention the pre requisites for evolution of a species. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Phenetics in taxonomy.

b) Infraspecific taxonomic hierarchy.

c) Ecads.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P778

[4034] - 202
M.Sc. (Sem. - II)
BOTANY
BO - 2.2 : Cell Biology and Instrumentation
(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Describe biogenesis, ultrastructure and functions of mitochondria. **[16]**

Q2) a) Explain the ultrastructure of a nucleus of plant cell. **[8]**

b) Describe the functions of peroxisomes and glyoxysomes. **[8]**

Q3) a) Describe organisation of nucleosome in eukaryotes. **[8]**

b) Explain the major events in cell cycle. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Organisation of centromere and telomere.

b) Lampbrush Chromosomes.

c) Lysosomes.

P.T.O.

SECTION - II

Q5) a) Describe plant wound signalling pathway. **[8]**

b) Explain ethylene activated two component signalling pathway. **[8]**

Q6) a) Mention the steps involved in reversible cell differentiation. Explain any one. **[8]**

b) Describe ultrastructure of secondary cell wall. **[8]**

Q7) a) Describe the principle and applications of Gel filtration. **[8]**

b) Explain the mechanism of separation of compounds using PAGE. **[8]**

Q8) Write explanatory notes on <u>any two</u> of the following : **[16]**

a) Working of Fluorescence microscope.

b) Applications of NMR.

c) Autoradiography.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P779

[4034] - 203

M.Sc. (Sem. - II)

BOTANY

BO - 2.3 : Molecular Biology and Genetic Engineering

(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Explain the concept of 1/2 cot value and cot curve and give its significance. **[16]**

Q2) a) Describe structure and role of eukaryotic promoter. Add a note on enhancer. **[8]**

b) Describe the mechanism of rolling. Circle and theta ϕ model of replication. **[8]**

Q3) a) Explain the mechanism of intron splicing from precursor RNA. **[8]**

b) Describe the concept of operon. Explain with a suitable example. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Eukaryotic transcription factors.

b) CDNA synthesis.

c) Processing of tRNA.

P.T.O.

SECTION - II

Q5) Explain the mechanism of protein synthesis in eukaryotes. **[16]**

Q6) a) Describe salient features of BAC and YAC vectors. **[8]**

b) Explain how E.coli cells are transformed with vector DNA. **[8]**

Q7) a) Mention at least five potential genes useful for development of drought tolerant transgenic plants. **[8]**

b) Describe the methodology of construction of Genomic libraries. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Ti and Ri plasmids.

b) Proteomics.

c) RFLP.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P780

[4034] - 301
M.Sc. - II (Sem. - III)
BOTANY
BO - 3.1 : Developmental Botany and Plant Tissue Culture
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each sections.***
2) ***Answers to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Describe the various steps involved in seed germination leading to establishment of seedling organ.

Q2) Explain :

a) The mechanism of transition from vegetative phase to reproductive phase in plant body.

b) The stages of development of female germ unit in plants.

Q3) Describe :

a) Phenomenon of double fertilization and triple fusion.

b) The routes of parthenogenesis citing suitable examples.

Q4) Write short notes on any two :

a) Juvenality.

b) Polyembryony.

c) Male germ unit.

P.T.O.

SECTION - II

Q5) Explain the factors influencing the establishment of callus and cell culture.

Q6) Give the application of plant tissue culture in floriculture and forestry.

Q7) Explain :

a) Why development of cybrids is important in crop plants?

b) Applications of embryo rescue techniques.

Q8) Write notes on any two :

a) Protoplast fusion.

b) Induction of somaclonal variation.

c) In vitro production of secondary metabolites.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P781

[4034] - 302
M.Sc. - II (Sem. - III)
BOTANY
BO - 3.2 : Environmental Botany and Plant Diversity
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least two questions from each sections.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***All questions carry equal marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What is ecological succession? Give its types and mechanism.

Q2) Explain the characters of population and add a note on survivorship curve.

Q3) a) Give consequences of Eutrophication.
b) Explain KYOTO protocol.

Q4) Write notes on any two :
a) EIA.
b) Concept of Biosphere.
c) Forest Act.

SECTION - II

Q5) What is species diversity? Explain diversity indices and species richness.

Q6) Explain value and use of biodiversity for medicine.

P.T.O.

Q7) a) Highlight different conventions on biological diversity.

b) Give forms and structure of community.

Q8) Write notes on <u>any two</u> :

a) Ecotone.

b) Factors affecting diversity.

c) Phytoremediation.

❖❖❖❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P782

[4034] - 303

M.Sc. - II (Sem. - III)

BOTANY

BO - 3.31 : Phycology

(2008 Pattern) (New Course) (Special Paper - I)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least two questions from each section.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***All questions carry equal marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Give an account of classification as per Bold and Wyne. Add a note on tools in algal taxonomy.

Q2) a) Give importance of algae in food web and other biotic associations.

b) Write briefly on ultrastructure of algal cell.

Q3) a) Comment on systematics of blue green algae with examples.

b) Write briefly on reproduction in Charales.

Q4) Write short notes on any two of the following :

a) Importance of BGA in agriculture.

b) Caulerpa.

c) Colonial algae.

P.T.O.

SECTION - II

Q5) Give general characters of brown algae and add a note on systematics of brown algae.

Q6) a) Comment on importance of brown algae in industry.

b) Comment on gonimoblast and cystocarp.

Q7) a) Give physicochemical properties of water.

b) Comment on ecological classification of algae.

Q8) Write brief notes on <u>any two</u> of the following :

a) Paleolimnology.

b) Algae of running water.

c) Intertidal ecology.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P783

[4034] - 304

M.Sc. - II (Sem. - III)

BOTANY

BO - 3.32 : Mycology and Plant Pathology - I

(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least two questions from each sections.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***All questions carry equal marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Give an outline of classification of fungi proposed by Alexopoulos. **[16]**

Q2) Describe thallus organization and reproductive structures in Myxomycota. **[16]**

Q3) Write short answers of the following : **[16]**

a) Economic importance of lichens.

b) Describe various ascocarps studied by you.

Q4) Write short notes on any two of the following : **[16]**

a) Bitunicate ascus.

b) Acervulus and sporodochium.

c) Eurotiales.

d) Dikaryotization.

P.T.O.

SECTION - II

Q5) Give an account of heterothallism observed in Mucorales, Oomycetes and Basidiomycetes. **[16]**

Q6) Describe the association of fungi in higher plants. State it's significance. **[16]**

Q7) Write short answers of the following : **[16]**

a) Colonization strategies in fungi.

b) Role of sex hormones in fungi.

Q8) Write short notes on any two of the following : **[16]**

a) Phylloplane.

b) Soil fungi.

c) Mycotoxins.

d) Genetical aspects of pathogenecity and resistance.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P784

[4034] - 305
M.Sc. - II (Sem. - III)
BOTANY
BO - 3.33 : Angiosperms - I
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least TWO questions from each sections.***
2) ***Answer to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) What is author citation? Describe different types of author citation with suitable examples.

Q2) Explain :

a) Multidisciplinary approach to systematics of santalaceae.

b) Systematics of Ranunculaceae.

Q3) Comment on :

a) Angiosperm diversity of Western Ghat.

b) Role of floral pigments in systematics.

Q4) Write notes on <u>any two</u> :

a) Effective and valid publication.

b) Role of embryology in systematics.

c) Procedure for describing new genus and species.

P.T.O.

SECTION - II

Q5) Give an account of any two botanical gardens of India.

Q6) Explain :

a) Biosystematic categories.

b) Herbarium as a multipurpose resource institute.

Q7) Give aims and objectives of Biosystematics. Add a note on Clausen's experiment.

Q8) Write notes on any two :

a) Role of Botanical garden in Teaching and Research.

b) Objectives and functions of herbarium.

c) Numerical taxonomy.

❖❖❖❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P785

[4034] - 306
M.Sc. - II (Sem. - III)
BOTANY
BO - 3.34 : Plant Physiology
(2008 Pattern) (New Course) (Special Paper - I)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each section.***
2) ***Answer to the TWO sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagram must be drawn WHEREVER necessary.***

SECTION - I

Q1) Explain the effect of salt stress on plant metabolism and the mechanism of salt stress tolerance in higher plants.

Q2) Give an account of water logging injury and mechanism of flooding tolerance in higher plants.

Q3) a) Explain drought resistance mechanism in plants.

b) Discuss the scope and importance of abiotic stress.

Q4) Write short notes on any two :

a) Role of proline and stress induced proteins.

b) Causes of salinity and improvement in saline and sodic soils.

c) Manganese toxicity.

P.T.O.

SECTION - II

Q5) Explain the effect of UV-A and UV-B radiation on plant metabolism.

Q6) Enlist the air pollutants and explain the effect of any two air pollutants on plant metabolism.

Q7) a) Describe the causes and effects of aluminium and zinc toxicity on plant metabolism.

b) Comment on : scavenging of free radicals.

Q8) Write short notes on <u>any two</u> :

a) Scope and importance of Xenobiotic stress.

b) Mechanism of UV radiation tolerance.

c) Photoinhibition.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P786

[4034] - 307

M.Sc. - II (Sem. - III)

BOTANY

BO - 3.35 : Genetics, Molecular Biology & Plant Breeding - I

(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each section.***
2) ***Answer to the TWO sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Explain chromosomal theory of Inheritance and describe structural and organizational complexity of eukaryotic chromosomes. **[16]**

Q2) a) Describe origin, production & meiotic behavior of haploids. **[8]**

b) Explain genetic recombination in bacteria through conjugation. **[8]**

Q3) a) Describe production, characterization & utility of alien addition lines. **[8]**

b) Explain interaction of genes in plants with any two suitable examples. **[8]**

Q4) Write brief account of <u>any two</u> of the following : **[16]**

a) Role of Trisomics in chromosome mapping.

b) FLP/FRT recombination system.

c) Null hypothesis & test of independence.

P.T.O.

SECTION - II

Q5) Explain the methodology of production of hybrid seeds using cytoplasmic-genetic male sterility and add a note on merits of hybrid varieties. **[16]**

Q6) a) Explain the mechanism of homologous and non-homologous recombination. **[8]**

b) Describe the methodology of improvement of vegetatively propagated plants by clonal selection. **[8]**

Q7) Describe :

a) Describe the procedure of mass selection & add a note on its merits & demerits. **[8]**

b) Describe the various treatment methods & starting material for mutation breeding. **[8]**

Q8) Write brief account of any two of the following : **[16]**

a) Evolution of Wheat & Mustard.

b) Somatic cell genetics.

c) Varietal release.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P787

[4034] - 308
M.Sc. - II (Sem. - III)
BOTANY
BO - 3.36 : Plant Biotechnology - I
(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each section.***
2) ***Answer to the TWO sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagram must be drawn WHEREVER necessary.***

SECTION - I

Q1) Give an account of common media used for various cultures. Explain the method of handling and preparation.

Q2) a) Describe the advantages of plant tissue culture technique over conventional methods in crop improvement.

b) Explain why acclimatization of plant lets is necessary.

Q3) a) Explain why somatic embryogenesis method is attractive to the forest industry.

b) Enlist major equipments used and describe their role in establishment of in-vitro culture.

Q4) Write notes on any two :

a) Organogenesis.

b) Genetic basis for somaclones.

c) Establishment of aseptic explant culture.

P.T.O.

SECTION - II

Q5) Explain with suitable examples, the quality improvement of carbohydrates or lipids using transgenic crop plants.

Q6) a) Comment on advantages and limitations of single cell proteins.

b) Explain the improvement of secondary metabolites production in transgenic plants.

Q7) a) Explain why in-vitro production of haploids is important in plant breeding.

b) Comment on environmental conditions and applications of green house technology.

Q8) Write notes on any two :

a) Importance of Cryopreservation.

b) Biotic stress tolerance in transgenic crop plants.

c) Symmetrical and asymmetrical somatic hybrids.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P788

[4034] - 309
M.Sc. (Sem. - III)
BOTANY
BO - 3.37 : Plant Diversity
(2008 Pattern) (New Course) (Paper - I)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any FIVE questions, taking at least TWO questions from each section.***
2) ***Answer to the TWO sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagram must be drawn WHEREVER necessary.***

SECTION - I

Q1) What is ecosystem diversity? Describe wetland, marine and tropical moist-forests ecosystems.

Q2) Comment on :

a) Factors affecting species distribution.

b) Bryophyte diversity with reference to habit.

Q3) a) Give the methods of assessing and measuring biodiversity.

b) Explain Agrobiodiversity.

Q4) Write short notes on any two :

a) Species concept.

b) Scope of biodiversity.

c) Allozyme method.

P.T.O.

SECTION - II

Q5) What is species diversity? Add a note on global distribution of species richness.

Q6) Explain :

a) Endemism and Biodiversity.

b) Angiosperm diversity with reference to habitat.

Q7) Comment on :

a) Plant diversity hot spots.

b) Origin of species.

Q8) Write short notes on <u>any two</u> :

a) Centres of diversity.

b) Landscape level of Biodiversity.

c) Techniques for monitoring fish diversity.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P789

[4034] - 310

M.Sc. (Sem. - III)

BOTANY

BO - 3.38 : Seed Technology (Special Paper - I)

(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least TWO questions from each section.***
2) ***Answer to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Define seed. Give chemical composition of albuminous and exalbuminous seeds.

Q2) Explain :

a) Concept of seed dormancy,

b) Role of seed technology.

Q3) Describe :

a) Biochemical changes during seed germination,

b) Seed health testing methods.

Q4) Write short notes on any two :

a) Important seed industries in India,

b) Diseases of Kharip Crop.

c) Seed vigour.

P.T.O.

SECTION - II

Q5) Describe seed borne diseases and add a note on its control measures.

Q6) Comment on :

a) Effect of environmental factors on seed production,

b) Seed longevity.

Q7) Explain methods of seed treatment.

Q8) Write short notes on any two :

a) Methods of seed storage,

b) Seed certification,

c) Life cycle of any one pest.

❖❖❖❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P790

[4034] - 401
M.Sc. (Sem. - IV)
BOTANY
BO - 4.1 : Plant Resources and Evolution
(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Justify Plants as multipurpose natural resources. **[16]**

Q2) a) What are secondary metabolites? Describe the nature of active principle, plant resource and pharmacological activity of any two secondary metabolites. **[8]**

b) What is energy plantation. How are plants selected for plantation? Name at least four species used for the purpose. **[8]**

Q3) Describe two qualitative and two quantitative methods of phytochemical analysis of proteins. **[16]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Introduction and domestication of plants.

b) Physical evaluation of crude drug.

c) Forensic botany.

P.T.O.

SECTION - II

Q5) Describe evolutionary history of cycadales and pteridospermales. **[16]**

Q6) a) Explain the concept of symbiotic origin of a eukaryotic cell. **[8]**

b) Explain the origin and advantages of multicellularity. **[8]**

Q7) a) Explain the significance of nucleotide sequence analysis in understanding phylogeny. **[8]**

b) Explain the concept of adaptive radiation. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Hardy. Weinberg law.

b) Convergent evolution.

c) Evolutionary time scale.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P791

[4034] - 402
M.Sc. (Sem. - IV)
BOTANY
BO - 4.2 : Applied Botany
(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the two questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) What is sea farming? Mention its principles and methods. **[8]**

b) Justify the advantages of sea farming cite suitable examples. **[8]**

Q2) Describe the technology for mass production of Spirulina. Add a note on its nutritive value. **[16]**

Q3) a) Mention the types of fungal fermentation. Explain any one in detail. **[8]**

b) Enlist the biochemicals of fungal origin. Explain the method of production of any one. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Algae used for sewage treatment.

b) Application of mycorrhiza in agriculture.

c) Myconematicides.

P.T.O.

SECTION - II

Q5) a) Explain the applications of Lignocellulosic Fungi. **[8]**

b) Enlist animal diseases caused by Fungi Describe the symptoms and causative organism for any two. **[8]**

Q6) a) Mention Measures of central tendency. Explain any one. **[8]**

b) Distinguish between parametric and non parametric statistics. **[8]**

Q7) a) Explain with suitable examples, the application of t test and chisquare test. **[8]**

b) Describe one nucleic acid and one protein data base. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Applications of bioinformatics.

b) Search engines.

c) Data mining.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P792

[4034] - 403
M.Sc. - II (Sem. - IV)
BOTANY
BO - 4.41 : Phycology Special Paper - II
(2008 Pattern) (New Course)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, taking at least TWO questions from each section.***
2) ***Answer to the two sections should be written in SEPARATE answer books.***
3) ***All questions carry EQUAL marks.***
4) ***Neat labelled diagrams must be drawn WHEREVER necessary.***

SECTION - I

Q1) Describe the chemical composition and nutritional values of Chlorella, Seenedesmus and Spirulina.

Q2) a) What is raft technique? Describe its types an comment on its merits and demerits.

b) What is continuous culture system? Add a note on the merits and demerits of open pond system and closed tubular system.

Q3) Describe different methods used for measurement of algal growth in micro algae cultivation.

Q4) Write short notes on any two of the followings :

a) Agarophytes.

b) Strain selection.

c) Cryopreservation of algae.

P.T.O.

SECTION - II

Q5) What are Biofertilizer Describe the different type of biofertilizers and add a note on seaweed liquid fertilizer.

Q6) a) Comment on precautions to be taken during the tissue cultural practices of marine macro algae.

b) Comment on the various seaweed resources of India.

Q7) a) Describe the role of algae in sewage disposal and waste water treatment.

b) Describe different types of phycocolloides and its uses.

Q8) Write short notes on <u>any two</u> of the following :

a) SCP.

b) Algae in biofuel production.

c) Algae as a raw material for industries.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P793

[4034] - 404

M.Sc. (Sem. - IV)

BOTANY

BO - 4.42 : Mycology and Plant Pathology

(2008 Pattern) (New) (Special Paper - II)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What is industrial mycology? Explain solid substrate fermentation w.r.t. control conditions and product (s) obtained from specific fungus. **[16]**

Q2) a) What are immuno regulators? Name such compounds obtained from fungi. Mention the fungal species used. **[8]**

b) What is a single cell protein? How is it obtained from fungi? **[8]**

Q3) Explain use of : **[16]**

a) Fungal enzymes for detoxification of pesticides.

b) Fungi for production of flavors and aroma.

Q4) Write explanatory notes on any two of the following : **[16]**

a) Novel fungal textiles.

b) Fungi as biocontrol agents.

c) Fermented foods.

P.T.O.

SECTION - II

Q5) Compare super ficial mycosis and subcutaneous mycosis w.r.t. causative fungi, symptoms and curative measures. **[16]**

Q6) What is the scope of plant pathology? What are the peculiar features of pathogenic fungi? Explain the mechanism of plant Pathogenesis. **[16]**

Q7) Explain any one post infectional changes in the physiology of host plant. Add a note on defence mechanisms in plants. **[16]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Environmental control of plant diseases.

b) Fungitoxins.

c) Leaf blights.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P794

[4034] - 405

M.Sc. (Sem. - IV)

BOTANY

BO - 4.43 : Angiosperms (Special Paper - II)

(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What is an arboretum? Describe its organisation, units and facilities. Add a note on importance of an arboretum. **[16]**

Q2) a) Explain the criteria used to select the plants for agroforestry. **[8]**

b) Describe uses of wood in relation to properties. **[8]**

Q3) What is wood? How does it develop? Explain the gross structure of ring porous wood. Describe the distribution of wood elements. **[16]**

Q4) Write explanatory notes on <u>any two</u> of the following : **[16]**

a) Anatomy of arborescent monocoty ledon.

b) Maintenance of trees.

c) Somatic embryogenesis.

P.T.O.

SECTION - II

Q5) Explain the course of development of pollen grain of an angiosperm from microspore to tricelled pollen grain. **[16]**

Q6) a) Explain the importance of Floral calender in mellitopalynology. **[8]**

b) Distinguish between unifloral and multifloral honeys. **[8]**

Q7) Define gynogenesis. Explain the events that lead to gynogenesis in vivo. Comment on its significance. **[16]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Ultrastructure of endosperm.

b) Advantages of androgenesis.

c) In vitro fertilization in angiosperms.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P795

[4034] - 407

M.Sc. (Sem. - IV)

BOTANY

BO - 4.45 : Genetics, Molecular Biology & Plant Breeding - II

(2008 Pattern) (New)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What is molecular mapping of genome? Describe genetic and physical mapping. **[16]**

Q2) a) Describe in vivo amplification of plasmid DNA. **[8]**

b) Explain difficulties in breeding for drought resistance and drought hardening. **[8]**

Q3) a) Describe technique of northern blotting. **[8]**

b) Describe technique of sequencing whole genome. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Mitochondrial genome.

b) PCR.

c) Chromosome walking.

P.T.O.

SECTION - II

Q5) Give an account of breeding for nutritional quality with special reference to protein. **[16]**

Q6) a) Describe use of domestication and selection for breeding oil seed crops. **[8]**

b) Describe with suitable example, gene environment interaction. **[8]**

Q7) a) Describe biological utilization of proteins. **[8]**

b) Explain the importance of crop management. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Hybrid arrest and release.

b) Genome project.

c) Distant hybridization.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P796

[4034] - 408

M.Sc. (Sem. - IV)

BOTANY

BO - 4.46 : Plant Biotechnology

(2008 Pattern) (New) (Special Paper - II)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answers to the questions from each section should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What are Southern, Northern and Western blotting? Explain the technique and mention the applications. **[16]**

Q2) a) What are gene synthesis machines? Explain with an appropriate example? **[8]**

b) What are DNA libraries? How are these developed? **[8]**

Q3) Define Genomics. Mention the procedures employed there in. Explain any one. **[16]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Structural and functional genomics.

b) Chromosome Walking.

c) Recombinant DNA Technology.

P.T.O.

SECTION - II

Q5) What is proteomics? Describe the strategies of proteomics. Explain any one. **[16]**

Q6) Mention the applications of proteomics and explain any one with suitable example. **[16]**

Q7) Enlist the biotechnologies applicable in agriculture. Explain any one in detail. **[16]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Bioethical aspects of agricultural biotechnology.

b) Pharmacogenomics.

c) Nif genes.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P797

[4034] - 409
M.Sc. (Sem. - IV)
BOTANY
BO - 4.47 : Plant Bio-Diversity
(2008 Pattern) (New) (Special Paper - II)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Attempt a total of five questions from the following, selecting at least two questions from each section.***
2) ***Answer to the questions from each sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat labeled diagrams must be drawn wherever necessary.***

SECTION - I

Q1) Explain the role of educational institutes in documentation and management of plant diversity. **[16]**

Q2) Explain the causes and consequences of loss of ecosystem diversity. **[16]**

Q3) a) Enlist latest categorization of 'Threatened Species' by IUCN. **[8]**

b) Mention IUCN's perception of conservation. Add a note on in situ conservation. **[8]**

Q4) Write explanatory notes on any two of the following : **[16]**

a) Ecosystem restoration.

b) Species extinction.

c) Participatory forest management.

P.T.O.

SECTION - II

Q5) Explain, with suitable examples the advantages and limitations of ex situ, ex vitro conservation. **[16]**

Q6) Explain the concept, methodology, advantages and limitations of conservation biotechnology. **[16]**

Q7) a) What is biological invasion? Explain its evolutionary impacts. **[8]**

b) Explain the concept of plant diversity as a sources of carbon sink. **[8]**

Q8) Write explanatory notes on any two of the following : **[16]**

a) Biodiversity data bases.

b) Biodiversity prospecting.

c) IPRs and ownership of traditional knowledge.

❖ ❖ ❖ ❖

Total No. of Questions : 8] **[Total No. of Pages : 2**

P798

[4034] - 410

M.Sc. (Sem. - IV)

BOTANY

BO - 4.48 : Seed Technology

(2008 Pattern) (New) (Special Paper - II)

Time : 3 Hours] ***[Max. Marks :80***

Instructions to the candidates:

1) ***Answer any five questions, selecting at least two questions from each section.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***All questions carry equal marks.***

SECTION - I

Q1) Describe the process of seed production of Maize.

Q2) Explain :

a) Importance of quality seeds.

b) Concept and objectives of seed processing.

Q3) Comment on :

a) Seed certification.

b) DNA finger printing.

Q4) Write short notes on any two of the following :

a) Seed pelleting.

b) Genetic purity.

c) RAPD.

P.T.O.

SECTION - II

Q5) Give an account of seed production of Brinjal.

Q6) Explain :

a) Post harvest operations of seed processing.

b) Quick variability test.

Q7) Describe :

a) Concept and procedure of artificial seed production.

b) Aids for varietal identification.

Q8) Write short notes on any two of the following :

a) PCR,

b) Electrical conductivity seperation,

c) Seed protection.

❖❖❖❖