

Total No. of Questions : 8]

[Total No. of Pages : 2

P1044

[3727] - 306

M.Sc. - II

BOTANY

BO - 3.34: Plant Physiology (Special paper - I)

(New) (Sem. - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, taking atleast two questions from each section.*
- 2) Answers 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.*

-
- 1) What are halophytes? Explain various mechanisms of salinity tolerance in halophytes.*
 - 2) What is water logging? Give the causes, importance and consequences of water logging.*
 - 3) a) What is the difference between saline and sodic soils? Add a note on their causes.*
b) Comment on the role of proline, polyols and stress induced proteins in water stress condition.
 - 4) Write notes on any two of the following:*
 - a) Mechanism of flood tolerance.*
 - b) Study of stress physiology in present context.*
 - c) Effects of drought on plant metabolism.*

P.T.O.

SECTION - II

- 5) Describe the effect of air pollutants like CO and SO₂ on the metabolism of plant.
- 6) What is photoinhibition? Add a note on the mechanism of uv tolerance.
- 7)) What is the scope, concept and importance of ion stress.
- b) What is ROS generation? Add a note on its effect on plants and on its scavenging.
- 8) Write notes on any two of the following:
-) Scope and importance of pollution stress.
 - b) Toxicity of Fe and Mn on plant metabolism
 - c) Mechanism of ion toxicity tolerance.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1045

[3727] - 307

M.Sc. - II

BOTANY

BO - 3.35: Genetics Molecular Biology and Plant Breeding - I

(Sem. - III) (New 2008 Pattern)

(Special paper - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 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

- 1) Describe the structural and organizational complexities in eukaryotic chromosomes.*
- 2) Explain the mechanism of genetic recombination in viruses.*
- 3) What are haploids? Give their importance and describe the methods for their production.*
- 4) Give a brief account of any two:*
 - a) Chi square test.*
 - b) Transmission genetics.*
 - c) Karyotype evolution.*

P.T.O.

SECTION - II

- 5) Describe the steps in production of hybrid seeds by using manual emasculation method.
- 6) What are mutations? Describe handling of mutagen treated material and M_1, M_2 progenies
- 7)) Give significance of correlations in plant breeding.
- b) Describe salient features of lampbrush chromosome.
- 8) Write notes on any two of the following
-) objectives of plant breeding.
 - b) Satellite DNA.
 - c) Conjugation in bacteria.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1046

[3727] - 308

M.Sc.

BOTANY

BO - 3.36: Plant Biotechnology (Special Paper - I)

(New) (Sem. - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) Attempt in all five questions, selecting atleast two questions from each section.*
- 2) Answers to the two sections must be written in separate answer books.*
- 3) All questions carry equal marks.*

-
- 1) a) Enlist the basic techniques of plant tissue culture and explain any one.
b) Define morphogenesis. Explain any two factors affecting in vitro morphogenesis.
 - 2) Explain with suitable examples the advantages of tissue culture techniques over conventional methods of crop improvement.
 - 3) What are transgenic plants? How are they developed? Mention any four applications of transgenic plants.
 - 4) Write explanatory notes on any two of the following:
 - a) Cryopreservation.
 - b) Plant biotechnologies for phytoremediation.
 - c) Green house technology.

P.T.O.

SECTION - II

- 5) a) What is somatic embryogenesis? Mention its applications.
b) Give a design for a typical plant tissue culture laboratory name the different sections
- 6) a) Explain the methods of induction of somaclonal variation mention the methods of selection of somaclonal variants.
b) Explain with suitable example, the development of transgenic plants for stress tolerance.
- 7)) How are the transgenics developed for improving quality of lipids and proteins.
b) What is green house technology? Explain its application in plant propagation.
- 8) Write explanatory notes on any two of the following:
-) Single cell proteins.
 - b) Plant derived vaccines.
 - c) Management of plant tissue culture laboratory.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1047

[3727] - 309

M.Sc.

BOTANY

BO - 3.37: Plant Diversity Special paper - I

(2008 Pattern) (New) (Sem. - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidate:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 2) Answers 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

1) What is Biodiversity? Describe measurement of genetic diversity.

2) Explain:

- a) Role of landscape in diversity.
- b) Darwin's evidence for natural selection.

3) Comment on:

- a) Bryophytic diversity.
- b) Plant diversity hot spots in India.

4) Write short notes on: (any two)

- a) Macro and micro evolution.
- b) Endemism
- c) Importance of chromosomes in genetic diversity.

P.T.O.

SECTION - II

5) Define ecosystem diversity. Explain the measurement of ecosystem diversity of any two ecosystems diversity of the world.

6) Comment on:

- a) Algal diversity.
- b) Toxic diversity.

7) Explain the following:

-) Species richness in diversity.
- b) Transgenic organisms.

8) Write notes: (any two)

-) Nature and origin of genetic variation.
- b) Fossil evidences in diversity.
- c) Act of domestication.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1048

[3727] - 310

M.Sc. - II

BOTANY

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

(New Course) (Sem. - III)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 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.*

-
- 1) Describe in detail the development and structure of embryo in cereals.*
 - 2) Give an account of structure and chemical composition of seed.*
 - 3) a) Give an account of quality characteristics of seed.*
b) Write an account on the integrated management of seed borne diseases.
 - 4) Write short notes on any two of the following:*
 - a) Relevance of seed dormancy.*
 - b) Seed and grain.*
 - c) Micro sporazgium structure.*

SECTION - II

- 5) Write an account on life cycle, infestation and control measures of any two store grain pests.*
- 6) Give an account of the general principles of seed storage.*

P.T.O.

- 7)) Give an account of commercial features of good seed warehouse.
-) Give the causes of seed deterioration.

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

-) Seed transmission mechanism.
- b) Fibre crop pests.
- c) Seed treatment.

P1049

[3727] - 401

M.Sc. - II

BOTANY

BO - 4.1: Plant Resources & Evolution

(2008 Pattern) (New Course) (Sem. - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates

- 1) Answer any five questions, taking atleast two questions from each section.*
 - 2) Answers 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.*
-

1) Describe two Narcotic and two Insecticide yielding crops with respect to botanical name, common name, plant part used and uses.

- 2)** a) Give a brief account of importance of ethnobotany in Indian context.
b) Explain methods of qualitative and quantitative analysis of carbohydrates.

3) Describe major eras of evolutionary time scale with suitable plant fossil examples.

4) Write notes on any two:

- a) Lamarck concept of evolution.
- b) Allopatric evolution.
- c) Molecular tools in tracing phylogeny.

P.T.O.

SECTION - II

- 5) Give monographic account of drugs obtained from root and leaf.
- 6) a) Discuss origin and evolution of prokaryotes.
b) Give characteristic of pteridospermales.
- 7) a) Explain concept of change in gene frequency through natural selection.
b) Comment on origin of basic biological molecules.
- 8) Write notes on any two:
- a) Origin of cultivated plants.
 - b) Pharmacological activities of natural products.
 - c) Spectroscopic technique in phytochemical analysis.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1050

[3727] - 402

M.Sc. - II

BOTANY

BO - 4.2 : Applied Botany

(2008 Pattern) (New Course) (Sem. - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) *Answer any five questions, taking atleast two questions from each section.*
- 2) *Answers 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

- 1) Give an account of commercial production by trough / tray method of blue green algal biofertilizer. Add a note on it's impact on crop yield.
- 2) a) Explain biological methods of sewage treatment.
b) Discuss correlation with suitable examples.
- 3) a) What is nucleic acid data base? Explain any one method of data mining.
b) What is bioinformatics? Comment on its significance.
- 4) Write notes on any two of the following.
 - a) Nuisance causing algae.
 - b) Applications of sea weed farming.
 - c) Non-parametric statistics.

P.T.O.

SECTION - II

- 5) Describe in detail the production of antibiotics by fermentation technology.
- 6) a) Give an account of metabolic diversity among fungi.
b) Discuss role of fungi in agriculture as mycoinsecticides and mycoweedicides.
- 7) a) Give role of fungi in bioremediation.
b) Explain the technology for the production of any one edible mushroom.
- 8) Write notes on any two of the following.
- a) Antitumor and antiviral agent.
 - b) Fungal transformation.
 - c) Parametric statistics.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1051

[3727] - 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 condidates:

- 1) Answer any five questions, taking atleast two questions from each section.*
- 2) Answers 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

- 1) Give an account of necessity principles and methodology of marine algae cultivation.*
- 2) a) Comment on role of major and trace elements in nutrition of algae.
b) Describe the methods of isolation of algae.*
- 3) a) What is bioremediation? Give an account of design and maintenance of algal stabilization ponds.
b) Briefly describe technique of indoor production of micro algae.*
- 4) Write short notes on any two of the following:*
 - a) Cryopreservation of algae.*
 - b) Nutritional quality standerds of algal products.*
 - c) Synchronous culture.*

P.T.O.

SECTION - II

- 5) What are phycocolloids? Describe methods of extraction and uses of phycocolloids.
- 6) Elaborate biotechnological potential of algae for PUFA and enzymes contents.
- 7) a) What is algal biotechnology? Add a note on entrepreneurship development in it.
- b) Role of algae in hydrocarbon production.
- 8) Write short notes on any two of the following:
- a) Seaweed resources of India.
- b) Biofertilizer.
- c) Algae in Pharmaceuticals.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1052

[3727] - 404

M.Sc - II (Sem. - IV)

BOTANY

BO - 4.42: MYCOLOGY & PLANT PATHOLOGY (Special paper II)

(2008 Pattern) (New)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) *Answer any five questions, selecting atleast two questions from each section.*
- 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.*

1) What are primary and secondary metabolites of fungi? Comment on different types of fermentation.

- 2) a) Give an account of any two Immunoregulators.
b) Explain fungi are ideal biocontrol agents.

3) Comment on:

- a) Role of fungi in bioremediation.
- b) Detoxification of pesticides.

4) Write notes on any two

- a) Solid substrate fermentations.
- b) Fungal single cell proteins.
- c) Ergot alkaloids.

P.T.O.

SECTION - II

5) How do plants defend themselves?

6) a) How fungi acts as seed borne pathogens?

b) Discuss role of toxins in plant diseases.

7) Comment on:

a) Contributions of anton de Bary and B.B.Mundkur.

b) Causal organism, symptoms and controll measures of wilt and damping off diseases.

8) Write short notes on any two.

a) Candidiasis.

b) Powdery mildews.

c) Mycetoma.

P1053

[3727] - 405

M.Sc. - II

BOTANY

BO - 4.43: Angiosperms (Special Paper - II)

(2008 Pattern) (New Course) (Sem. - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 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

- 1)** What is arboretum? Describe its organization, units and facilities. Add a note on its importance.
- 2)**
 - a) Explain the various steps involved in micropropagation.
 - b) Enlist major important Indian timber plants. Give uses of any three of them.
- 3)** Describe structure and distribution of different elements of wood. Add a note on uses of wood.
- 4)** Write notes on any two of the following:
 - a) Androgenesis.
 - b) Anatomical features of arborescent monocots.
 - c) Features of an arborescent form.

P.T.O.

5) What is floral fidelity? Explain the complementarity between floral organization and pollinators. Add a note on bees as crop pollinators.

6) a) What is pollen germination? Describe the factors affecting pollen germination in vitro

b) Describe gametophytic apomixis with suitable diagrams.

7) Describe the ultrastructure and histocytology of endosperm of angiosperms.

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

a) Unifloral and multifloral honeys.

b) Artificial pollination.

c) Gynogenesis.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1054

[3727] - 407

M.Sc.

BOTANY

BO - 4.45: Genetics Molecular Biology and Plant Breeding

(Sem. - IV) (New) (2008 Pattern)

(Special Paper - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 2) Answers 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

- 1) What are molecular markers? Describe their applications in genome analysis.*
- 2) a) Describe applications of polymerase chain reaction.*
b) Give importance and characteristics of abiotic stresses.
- 3) a) Describe the technique of southern blotting.*
b) Give procedure for construction of genomic libraries.
- 4) Write notes on any two of the following:*
 - a) Chloroplast genome.*
 - b) Gene cloning.*
 - c) Polygenic inheritance.*

SECTION - II

- 5) What is drought? Explain genetics and sources of drought resistance.*

P.T.O.

- 6) a) Briefly outline the breeding approaches used for breeding oil yielding crops.
- b) Describe the strategy to identify molecular markers linked to disease resistance.
- 7)) Explain with suitable example breeding for nutritional quality.
-) Describe the importance of somaclonal variations in crop improvement.
- 8) Write notes on any two of the following:
-) Colony and plaque hybridization.
- b) Applications of DNA sequencing.
- c) Importance of genome projects in agriculture.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1055

[3727] - 408

M.Sc.

BOTANY

BO - 4.46: Plant Biotechnology (Special paper - II)

(2008 Pattern) (New) (Sem. - IV)

Time : 3 Hours]

[Max. Marks : 80

Instructions:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 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.*

1) Describe any two methods of DNA sequencing. Comment on its limitations.

2) a) Describe any two strategies for the characterization of novel protein.

b) Give applications of proteomics in drug development.

3) a) Describe the importance of DNA polymorphism in assessment of genetic variability..

b) Write the principal and method of western blotting.

4) Write notes on any two of the following:

a) Gene synthesis machine.

b) Genomic annotation.

c) DNA libraries.

P.T.O.

SECTION - II

5) Define genomics? Briefly explain the sequencing strategies for whole genome analysis.

6) a) Describe the principal and method of RAPD and comment on its applications.

b) Explain the mode of action of any four enzymes used in recombinant DNA technology.

7)) Mention applications of plant biotechnology in agriculture with suitable example.

) Describe ethical and economic issues of transgenic crops.

8) Write notes on any two of the following:

) Nif genes.

b) Microbes in leaching of metals.

c) Phytoremediation - one of the tool in environmental protection.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1056

[3727] - 409

M.Sc. - II

BOTANY

**BO - 4.47: Plant Bio-diversity (Special paper - II)
(2008 Pattern) (New) (Sem. - IV)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting atleast two questions from each section.*
- 2) Answers 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

- 1) Give a concise account of loss of genetic Biodiversity.*
- 2) Explain in detail in - situ conservation of bio-diversity.*
- 3) Explain.*
 - a) Role of bio- technology in Assessment of Biodiversity and Bioresources.
 - b) Ecological and Evolutionary impacts on biological invasions.
- 4) Write notes on any two:*
 - a) Loss of Agro - biodiversity.
 - b) Role of universities and educational institutes in Bio- diversity conservation.
 - c) Arctic and Alpine systems.

SECTION - II

- 5) Give concise account on organizations involved in framing policies and methodologies of biodiversity management.*

P.T.O.

6) Discuss in detail different methodologies for valuation of Bio-diversity.

7) Explain.

-) Clean Development Mechanism (CDM)
-) Environmental Protection Act,

8) Write notes on any two:

-) Bio-piracy
- b) ECO-tourism.
- c) Bio-diversity Act.

Total No. of Questions : 8]

[Total No. of Pages : 2

P1028

[3727]-45

M.Sc. - II

BOTANY

BO - 443 (c) : Mycology
(Sem. - IV) (Elective Paper)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

SECTION - I

Q1) Give an account of classification of fungi proposed by Ainswort (1973).

- Q2)** a) Describe the Colonization strategies among fungi.
b) Give brief account of fungi as insect symbionts.

Q3) Comment on :

- a) Fungal deterioration of cellulosic and non cellulosic material.
- b) Wood rotting fungi.

Q4) Write notes on any two :

- a) Lichens.
- b) Seed borne fungi.
- c) Mycotoxins.

P.T.O.

SECTION - II

Q5) Give an account of evolution of conidium in Mucorales.

- Q6)** a) Describe the plasmodia in myxomycotina.
b) Draw and describe reproductive structures in gastromycetes.

Q7) Comment on :

- a) Agaricales.
b) Fruiting bodies of Ascomycetes.

Q8) Write notes on any two :

- a) Coelomycetes.
b) Bird's nest fungi.
c) Fungi as tools in genetics.



P1029

[3727]-47

M.Sc.

BOTANY

BO - 443 e: Plant Physiology

(Sem. - IV) (Old Course) (2004 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, taking at least two questions from each section.*
- 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) Explain physiological basis of productivity in pulses.

Q2) Give a concise account on physiology of plant growth in polyhouse.

Q3) Explain

- a) Effect of soil pH on availability of minerals.
- b) Biochemical changes during ripening of Fruit.

Q4) Write notes on any two :

- a) Relevance of vernalisation on plant productivity.
- b) Crop-weed interaction.
- c) NAR and its dependence on light intensity.

SECTION - II

Q5) Give an account on effects and mechanism of tolerance with reference to temperature stress.

Q6) Describe defence mechanism in plants against pathogenic attack.

Q7) Explain

- a) Effect of flooding and anerobiosis on plant metabolism.
- b) Stress tolerance and genetic engineering.

Q8) Write short notes on any two:

- a) Salt tolerant crops.
- b) Xenobiotic Stress.
- c) Green revolution.



P1030

[3727] - 48

M.Sc. - II

BOTANY

BO - 443 f : Pharmacognosy

(Sem. - IV) (2004 Pattern Old)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Attempt any five questions, selecting at least two questions from each section.*
- 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) What is evaluation? Enlist various methods of physical evaluation methods. Explain any two of them.

Q2) Explain:

- a) Scope and importance of pharmacognosy.
- b) Chemical assay of Nux vomica.

Q3) a) What are alkaloids? Give its physical and chemical properties.

- b) Explain the criteria for import and export of medicinal plants.

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

- a) Biological assay of Ephedrine.
- b) Role of ethnobotany in medicinal plant research.
- c) Role of morphology and anatomy in criminology.

SECTION - II

- Q5)** What is monograph? Describe the detailed pharmacognostic account of Aconitum napellus.
- Q6)** a) Describe the detailed pharmacognostic account of Digitalis purpurea.
b) Give pharmacognostic account of strychnos nux-vomica.
- Q7)** a) What are glycosides? Give its therapeutic properties.
b) Explain the concept and relevance of ethnopharmacology.
- Q8)** Write short notes on any two of the following :
- a) Immobilization.
 - b) DNA finger printing.
 - c) In vitro production of secondary metabolite.



Total No. of Questions : 8]

[Total No. of Pages : 2

P1031

[3727]- 49

M.Sc. - II

BOTANY

BO - 443g : Seed Technology

(Sem.- IV) (2004 pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions selecting at least two questions from each section.*
- 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) What is hybrid seed? Explain the procedure of seed production of any one cereal crop.

- Q2)** a) Explain seed certification.
b) Describe various seed storage methods.

- Q3)** a) Describe the physiology of seed development.
b) Write critically about production of orthodox and recalcitrant seeds.

Q4) Write short notes on any two:

- a) Factors influencing seed composition.
- b) Quarantine rule for seeds.
- c) Seed dormancy.

P.T.O.

SECTION - II

- Q5)** Describe the procedure for seed production of any one leafy vegetables.
- Q6)** a) Describe the changes occurring during seed germination.
b) Explain the factors affecting profit and economic of farm management.
- Q7)** a) Explain the genetic purity and quality of seed testing.
b) Explain the importance of various equipments useful in seed processing.
- Q8)** Write short notes on any two:
a) Criteria for import and export of seeds
b) RAPD
c) Oil Seeds



Total No. of Questions : 8]

[Total No. of Pages : 2

P1032

[3727]- 50

M.Sc. - II

BOTANY

BO - 443 (h) : Plant Biodiversity (Elective paper)

(Sem.- IV) (Old) (2004 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 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) Give concise account of species diversity with respect to origin and diversity indices.

Q2) What is Agrobio-diversity? Give detailed account of origin and evolution of cultivated species diversity.

Q3) Explain:

- a) Nature and origin of genetic diversity
- b) Methodologies for valuation of Bio-diversity.

Q4) Write notes on any two:

- a) Wetland Ecosystem
- b) Plant diversity Hot spots in India
- c) Clean Development mechanism (CDM)

P.T.O.

SECTION - II

Q5) Write detailed account of loss of genetic diversity.

Q6) Explain in detail in-situ conservation of bio-diversity.

Q7) Explain:

- a) Role of biotechnology in Assessment of Biodiversity Bioresources.
- b) Eco-tourism and bio-diversity conservation

Q8) Write notes on any two:

- a) Sustainable development
- b) Conservation of species diversity
- c) Indigenous knowledge systems.



P1033

[3727]- 101

M.Sc. - I

BOTANY

BO - 1.1 : Systematics of Non Vascular Plants

(Sem.- I) (New Course) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 2) Answers 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 various patterns of Life Cycles in Charophyta with suitable examples.

- Q2)** a) Write an account on evolutionary trends in algae.
b) Give the interrelationships of heterocysts in cyanophyta.

- Q3)** a) Write the characters of Bryophytes.
b) Give an account of sexual reproduction in phaeophyta.

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

- a) Evolution of sporophytes in Bryophytes.
- b) Reproductive structure in Sphero carpales.
- c) Concept of plant systematics.

SECTION - II

Q5) Give an account of thallus structure, spore producing structures and life cycle pattern in Ascomycotina.

Q6) a) Discuss the evolution of sex in fungi.
b) Explain the life cycle pattern and spore producing structures in Zygomycotina.

Q7) a) Describe the structure of thallus organisation and mode of nutrition in Biotrophs.
b) Give an out line classification of fungi with reasons proposed by Ainsworth et al (1973) upto class level.

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

- a) Sporophyte of Anthoceros with evolutionary significance
- b) Significance of Bryophytes.
- c) Sources of data for plant systematics.



P1034

[3727]- 102

M.Sc. - I

BOTANY

(BO - 1.2) Plant Physiology and Biochemistry

(Sem.- I) (New Course) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, taking atleast two questions from each section.*
- 2) Answers 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) Give a critical account of electron transport system in plant mitochondria.
Add a note on cyanide resistant pathway.

Q2) Give an account of the recent concept of stomatal action and mechanism of signal transduction in guard cell.

Q3) a) Describe the biochemical changes that occur during seed germination.
b) Write in brief on phloem loading and unloading.

Q4) Write short notes on any two of the following :
a) Metabolic changes during ripening of fruits.
b) Modes of transport across membrane.
c) Impact of water stress on plant metabolism.

SECTION - II

- Q5)** Explain how enzyme activity is regulated by various factors.
- Q6)** Describe in detail the mechanism of nitrogen fixation in the root nodules of legumes.
- Q7)** a) How are carbohydrates classified? Explain the mechanism of biosynthesis and degradation of starch.
b) Describe the secondary structure of proteins.
- Q8)** Write notes on any two of the following :
- a) Principles of thermodynamics
 - b) Biosynthesis of glycolipids
 - c) Outline of shikimate pathway.



Total No. of Questions : 8]

[Total No. of Pages : 2

P1035

[3727]- 103

M.Sc. - I

BOTANY

BO - 1.3 : Principles of Genetics and Plant Breeding

(Sem.- I) (New) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 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 inheritance of quantitative trait in Nicotiana.

Q2) Explain with suitable examples interaction between nuclear and cytoplasmic genes.

Q3) Give brief account of

- a) Hardy-Weinberg law.
- b) Multiple factors hypothesis.

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

- a) Epistasis
- b) Concept of linkage
- c) Genetic drift

P.T.O.

SECTION - II

Q5) What is autopolyploidy? Explain its role in plant breeding.

Q6) Describe the concept of incompatibility. Give its types and applications in plant breeding.

Q7) Give brief account of

- a) Genetic basis of breeding
- b) Inversion heterozygotes

Q8) Write notes on any two of the following:

- a) Concept of biodiversity
- b) C-value paradox
- c) Karyotype



P1036

[3727]- 201

M.Sc.

BOTANY

BO - 2.1 : Systematics of Vascular Plants

(Sem.- II) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 2) Answers 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) Give comparative account of structure of sporophytes and gametophytes of cycadales.

Q2) Comment on morphological and anatomical features of gametophyte and sporophyte of filicales.

Q3) a) Explain evolutionary significance of heterosporous pteridophytes.
b) Distribution of gymnosperms in India.

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

- a) Life cycle pattern in pteridophytes.
- b) Morphological and anatomical features of Gnetales.
- c) Gametophytes of Welwetschiales.

SECTION - II

Q5) Explain the role of Phytochemistry and genome analysis in systematics.

Q6) Discuss classes and subclasses of Liliopsida of Cronquist.

Q7) a) Discuss Angiosperms as highly evolved and dominant group of plants.
b) Evolution and differentiation of species.

Q8) Write short notes on any two of the following:
a) Conservation and utilization of Angiosperm diversity.
b) Ecades and ecotypes.
c) Taxonomic categories.



P1037

[3727]- 202

M.Sc. - I

BOTANY

BO - 2.2 : Cell Biology and Instrumentation

(Sem.- II) (New) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 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) Explain the mechanism of Cell-cycle with suitable out line. Add a note on role of Cell-cell interaction and malignant growth.

- Q2)** a) Biogenesis and ultra structure of Nucleus.
b) Principles and working of TEM.

- Q3)** a) Ultra structure and functions of Golgi complex.
b) What is totipotency and cell differentiation. Add a note on organization of plant cell.

Q4) Write notes on any two of the following :

- a) Lysosomes.
- b) Plasmodesmata.
- c) Biogenesis and functions of cell-wall.

SECTION - II

- Q5)** a) Principles and working of cooling centrifuge.
b) Structure and functions of plasma membrane.

- Q6)** a) Iso electric focusing.
b) Give structure and functions of Mitochondria.

Q7) Explain cell signaling in plants. Add a note on plant wound signaling pathway.

Q8) Write notes on any two of the following:

- a) Endoplasmic reticulum.
- b) Molecular organization of centromere.
- c) Ribosomes.



P1038

[3727]- 203

M.Sc. - I

BOTANY

BO - 2.3 : Molecular Biology and Genetic Engineering

(Sem.- II) (New Course) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, taking at least two questions from each section.*
- 2) Answers 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) Discuss the chemical and thermal properties of DNA.

Q2) Describe in detail the structure of prokaryotic Genes.

- Q3)** a) With the help of diagrams explain the process of transcription in eukaryotes.
- b) Discuss the mechanism of protein synthesis in prokaryotes.

Q4) Write short notes on any two:

- a) Chaperons
- b) Structure of rRNA
- c) 'Z' DNA

SECTION - II

Q5) Describe the structure of BAC and YAC vectors.

Q6) Explain the biolistic method of gene transformation in plant.

Q7) a) Give the principle and method of polymerase chain reaction

b) Explain the principle of DNA fingerprinting. Add a note on its applications.

Q8) Write short notes on any two:

a) Southern blotting

b) Restriction endonucleases

c) Abiotic stress tolerance.



P1039

[3727]- 301

M.Sc. - II

BOTANY

BO - 3.1 : Developmental Botany and Plant Tissue Culture

(Sem.- III) (New)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Attempt any five questions, taking at least two questions from each section.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) All questions carry equal marks.*
- 4) Draw neat labelled diagrams wherever necessary.*

SECTION - I

- Q1)** a) Mention characteristic features of plant development
b) Explain in brief the role of polarity and symmetry in plant development
c) Enlist the intrinsic factors that control plant development
d) What are characteristics of juvenile phase of plant development?
- Q2)** a) Explain histo-cytochemical changes at the shoot apex during transition from vegetative to flowering phase.
b) Explain the development of any one type of ovule and female gametophyte.
- Q3)** a) Illustrate the structure of a male germ unit.
b) Explain the photo control of seed germination.
- Q4)** Write explanatory notes on any two of the following :
a) Development specific gene expression during embryogenesis.
b) Hormonal control of seed germination.
c) Apomixis.

SECTION - II

Q5) Explain the terms :

- a) Totipotency.
- b) Indirect organogenesis.
- c) Direct embryogenesis.
- d) Callus.

Q6) a) What is micropropagation? Mention its stages and explain any one application of micropropagation.
b) What is somaclonal variation? How are such variations induced? Mention their applications.

Q7) a) Mention the types of cultures used for production of secondary metabolites in vitro. Explain any one.
b) Explain in brief the process of embryo rescue.

Q8) Write explanatory notes on any two of the following.

- a) Protoplast culture and somatic hybridisation.
- b) Application of plant tissue culture techniques for short term and long term storage of germplasm.
- c) Endosperm culture.



P1040

[3727]- 302

M.Sc. - II

BOTANY

BO - 3.2 : Environmental Botany & Plant Diversity

(Sem.- III) (New Course) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer any five questions, selecting atleast two questions from each section.*
- 2) *Answers 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) Define ecosystem. Explain it's structure and function in detail. Add a note on ecological pyramids.

- Q2)** a) Define population. Enlist characters of population. Explain any two of them.
- b) What is GIS? Explain it's applications in environmental botany.

- Q3)** a) Define air pollution. Enlist different air pollutants. Explain the impact of SO₂ and PAN on plants.
- b) Explain the nature and ecological effect of heavy metals on environment.

Q4) Write notes on any two of the following :

- a) Concept of biosphere.
- b) Environment (Protection) Act.
- c) Phototropism and metabolism in community ecology.
- d) Kyoto Protocol.

SECTION - II

- Q5)** What is biodiversity? Enlist it's types. Describe in detail genetic diversity.
- Q6)** a) Explain the basis for phytogeographical classification and describe any two phytogeographic regions of India.
b) Explain the concept of phytoremediation with suitable examples.
- Q7)** a) Discuss the impact of anthropogenic factor on biodiversity.
b) Explain nature and origin of genetic variations.
- Q8)** Write notes on any two of the following :
- a) Medicinal value of biodiversity.
 - b) CBD.
 - c) Endemism.
 - d) Role of mycofertilizers in restoration ecology.



Total No. of Questions : 8]

[Total No. of Pages : 2

P1041

[3727]- 303

M.Sc. - II

BOTANY

BO - 3.31 : Phycology Special (Paper - I)

(Sem.- III) (New Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, taking at least two questions from each section.*
- 2) Answers 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 classification of green algae upto order level.

Q2) Give an account of interrelationship in the orders of blue green algae.

Q3) a) Describe origin of Flagella in eukaryotic cell.
b) Comment on flagellar architecture in volvocales.

Q4) Write notes on any two of the following :

- a) Symbiotic associations by algae.
- b) Phragmoplast.
- c) Ultrastructure of eukaryotic algal cell.

P.T.O.

SECTION - II

Q5) Describe classification of red algae upto order level.

Q6) Comment on systematics of brown algae.

Q7) a) Describe adaptations in algae of running waters.

b) Give brief account of oxygen cycle in aquatic body.

Q8) Write notes on any two of the following :

a) Infralittoral zone.

b) Flotation coefficient.

c) Terrestrial algae.



P1042

[3727]-304

M.Sc. - II

BOTANY

BO - 3.32: Mycology and Plant Pathology - I

(Sem. - III) (New Course) (Special Paper - I)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer any five questions, selecting at least two questions from each section.*
- 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 types of basidiocarps and write their significance in taxonomy.

Q2) Give an outline of classification of fungi upto order as proposed by Ainsworth et al (1973).

- Q3)** a) Describe internal structure of Lichen thallus.
b) What is plasmodium? Describe different plasmodia in Myxomycotina.

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

- a) Spore types in Deuteromycotina.
- b) Sexual reproduction in Zygomycotina.
- c) Systematic position of Taphrinales.

SECTION - II

Q5) Give an account of evolutionary relationships in Ascomycetes.

Q6) Explain heterothalism and give it's importance in Mucorales.

Q7) a) Give the importance of rhizosphere.

b) Give an account of fungal association with algae.

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

a) Host resistance against fungi.

b) Insect fungi.

c) Colonization strategies in fungi.

