NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–I, PAPER–I

(Biodiversity of Plants and Diversity of Algae)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions, selecting at least two questions from each group. All questions carry equal marks.

GROUP 'A'

1. What do you mean by Biodiversity ? Explain its evolution.
2. Discuss the status of biodiversity in India.
3. Describe the values of Biodiversity.
4. What is Ecosystem ? Describe its structure and function.
5. Describe in details the biotic and abiotic components of any terrestrial ecosystem.

GROUP 'B'

6. Describe the major grounds of classification of Algae.
7. Elaborate the term toxic algae and discuss the role of algal toxins in human life.
8. Describe the sexual reproduction in Phaeophyceae.
9. Write short notes on any ***Four*** of the following :–
   (a) Symbiotic Cyanophyceae (b) Kelp
   (c) Nitrogen fixation by Algae (d) Algae as food
   (e) Agar-Agar (f) Algae as fertilizer
10. Describe the asexual reproduction in Chlorophyceae.

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Examination Programme-2012

M.Sc. Botany, Part–I

Date	*Papers*	*Time*	*Examination Centre*
09.05.2012	Paper–I	8.00 AM to 11.00 AM	Nalanda Open University, Patna
11.05.2012	Paper–II	8.00 AM to 11.00 AM	Nalanda Open University, Patna
15.05.2012	Paper–III	8.00 AM to 11.00 AM	Nalanda Open University, Patna
17.05.2012	Paper–IV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
19.05.2012	Paper–V	8.00 AM to 11.00 AM	Nalanda Open University, Patna
21.05.2012	Paper–VI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
23.05.2012	Paper–VII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
25.05.2012	Paper–VIII	8.00 AM to 11.00 AM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–I, PAPER–II

(Microbiology and Diversity of Fungi)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions, selecting at least two questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Describe the method of staining of bacteria as proposed by Christian Gram. Explain the significance of Gram +ve and Gram –ve bacteria on the basis of this staining procedure.
2. What are macro– and micronutrients in context to the bacterial nutrition ? What specific role do these nutrients play in bacterial metabolism.
3. What are distinguishing characteristics of transformation, transduction and conjugation ?
4. Describe the structure and method of replication of Virus.
5. Give an account of human diseases caused by the microbes.

GROUP 'B'

6. How do fungi derive nutrition from polymeric organic compounds ?
7. Give an account of mycotoxins.
8. What are mycorrhiza ? Give a brief account of mycorrhiza.
9. Describe the usefulness of fungi.
10. Write notes on any ***Two*** of the following :–
    (a) Life cycle of mushroom
    (b) Fungi as causal organisms of plant diseases
    (c) Sexual reproduction in Ascomycotina
    (d) Clamp Connection.

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

Part–I, Paper–III

(Plant Pathology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Classify plant diseases on different grounds.
2. Describe the role of toxins in plant diseases.
3. Give an account of various structural defence mechanism adopted by plants against pathogenic infection.
4. Give detailed account of pre-existing various biochemical defence in plants against pathogens.
5. Write notes on any ***Four*** of the following :–
   (a) Contribution of Prof. Millardet (b) Cellulase
   (c) Phytoalexins (d) Alternate host
   (e) Immunisation (f) Mixed cropping
6. Give the concept of biological control of plant diseases. Quote examples how the soilborne plant diseases are biologically controlled.
7. Distinguish between rhizosphere and rhizoplane. Discuss critically the role of rhizosphere microorganisms in the development of root disease.
8. Describe the symptoms, disease cycle and control of loose smut of wheat.
9. Describe the symptom, name of causal organism, disease cycle and control of late blight of potato.
10. Write notes on any ***Two*** of the following :–
    (a) Pathological aspects of mycorrhiza
    (b) Antibiotics
    (c) Capper fungicide
    (d) Crop rotation

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—: आवश्यक सूचना :—

M.Sc. Botany, Part–I के सभी परीक्षार्थियों को सूचित किया जाता है कि पटना नगर निगम चुनाव के कारण दिनांक 17.05.2012 को होने वाली Paper–IV की परीक्षा अब दिनांक 18.05.2012 को प्रातः 8 बजे से 11 बजे के बीच आयोजित की जायेगी । अन्य पत्रों की परीक्षा अपने पूर्व निर्धारित तिथि, समय एवं स्थान पर आयोजित होगी ।

NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–I, PAPER–IV

(Biology and diversity of Bryophyta and pteridophyta)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions, selecting at least two questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Describe the vegetative propagation and perennation in Bryophytes.
2. Give general account of Jungermanniales. Discuss its affinity.
3. Describe the reproduction of *Calobryum* and mention its affinity.
4. Describe the external and internal structure of the gametophyte of *Marchantia*.
5. Write notes on any ***Two*** of the following :–
   (a) Sporophyte of Marchantiales
   (b) Gametophyte of Metzgerineae
   (c) Medicinal use of Bryophyta
   (d) Indirect use of Bryophyta

GROUP 'B'

6. Describe heterosporus habit. How many members are heterosporous ? Describe them in brief with suitable diagrams.
7. Give an account of *Isoetes* and its affinities.
8. Describe the leptosporangiate mode of development in ferns.
9. Describe the position of sori and structure of sporangia in *Gleichenia* and *Adiantum*.
10. Write notes on any ***Two*** of the following :–
    (a) Equisetophyta
    (b) Siphonostete
    (c) Eusporangiate ferns
    (d) Spore producing organs of *Psilotum*.

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–I, PAPER–V

(Gymnosperms and Angiosperms)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer Five Questions in all, selecting at least two questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Describe the distribution of Gymnosperms.
2. Describe the fructification of *Cordainthus* and its affinity.
3. Describe the development of male gametophyte of *Pinus* and *Ginkgo*.
4. Give an account of the development of ♀ gametophyte of Gnetum.
5. Write notes on any ***Two*** of the following :–
   (a) Medicinal importance of Gymnosperm
   (b) Affinity of Gymnosperm with Pteridophytes
   (c) Mesozoic era
   (d) Sperm of cycas

GROUP 'B'

6. Describe the phenetic system of classification of Angiosperm.
7. Write about the Takhtajan system of classification of Angiosperms.
8. Describe the importance of taximetrics in taxonomy.
9. Describe the role of botanical gardens.
10. Describe the range of floral variation in Alismaceae and discuss its affinity.

Or,

Write notes on any ***Four*** of the following :–

(a) Nomenclature
(b) Palynotaxonomy
(c) Alpha and Omega taxonomy
(d) Role of herbaria in taxonomic research
(e) Numerical taxonomy
(f) National Botanical Garden, Lucknow

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M.Sc. Botany

Part–I, Paper–VI

(Management of Forest Resources)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. What are the benefits of forest ? Explain in details.

2. Describe the forest ecosystem.

3. How can the forest resources be controlled and managed ?

4. Describe the classification of forest soil.

5. Explain the role of Agroforestry in our country.

6. Discuss the use of Somatic embryogenesis.

7. What is Cryopreservation ? Give an account of cryopreservation along with its utility.

8. What is pulp and paper ? Describe the process of paper making.

9. Describe the method for measurement of volume of a standing tree.

10. Write short notes on any ***Four*** of the following :–
    (a) Fibres from the forest
    (b) Tropical evergreen forest
    (c) Tribal people and forest
    (d) Use of growth hormones for rooting in cuttings.
    (e) Micropropagation
    (f) Katha

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M.Sc. Botany

Part–I, Paper–VII

(Cell Biology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Give an experimental proof in support of biochemical theory of origin of life.

2. Describe the structure of fluid mosaic model of plasmamembrane. Why this model is widely accepted ?

3. Explain the structure and function of endoplasmic reticulum.

4. Give the detailed structure of chloroplast.

5. Describe the structure and chemistry of chromosome.

6. What do you mean by carcinogens ? Explain different types of carcinogens.

7. Describe the process and significance of meiosis.

8. Discuss the role of cyclic AMP in cell interaction.

9. Explain the phenomenon of differentiation in plants.

10. Write notes on any ***Two*** of the following :–
    (a) Microtubules
    (b) Structure and function of nucleolus
    (c) Viral chromosome
    (d) Z–DNA

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–I, PAPER–VIII

(Anatomy and Embryology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer Five Questions in all, selecting at least two questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Describe the internal factors of differentiation.
2. Give an account of shoot apical meristem.
3. Describe the vasculature of a typical dicot flower.
4. Discuss the role of stem anatomy in solving the problems of taxonomy.
5. Write shorts notes on any ***Four*** of the following :–
   (a) Dermatogen (b) Periblem
   (c) Cambium (d) Seed coat of Crucifers
   (e) Wound cork (f) Guard cells

GROUP 'B'

6. Describe the pollen tube growth through pistil.
7. Give an account of barriers of fertilization and the methods to overcome it.
8. Give an account of haploid production through anther culture.
9. Discuss the technique and advantage of ovary, ovule and endosperm culture.
10. Write notes on any ***Two*** of the following :–
    (a) Syngamy
    (b) Nuclear endosperm
    (c) Genetically induced parthenocarpy
    (d) Embryo sac

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

PART–II, PAPER–IX

(Plant Physiology and Biochemistry)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer Five Questions in all, selecting at least two questions from each group.
All questions carry equal marks.

GROUP 'A'

1. Describe the morphogenetic affects of light on flowering and explain the reversible photoreaction governing flowering.

2. What are gibberellins ? Discuss their mode of action and role in the physiology of plants.

3. Describe the light reactions of photosynthesis.

4. What are the causes of seed dormancy ? Describe the methods to break seed dormancy.

5. Write notes on any ***Two*** of the following :–
   (a) Cytokinin
   (b) Apogeotropic root
   (c) C_3 Cycle
   (d) Change in reserve food of seed at germination.

GROUP 'B'

6. Give an account of vitamins.

7. Describe the reactions of tricarboxylic acid cycle.

8. What do you mean by biological nitrogen fixation ? Give an account of the role of microbes in nitrogen fixation.

9. What are secondary metabolites ? Give the biological function of secondary metabolites.

10. Write notes on any ***Two*** of the following :–
    (a) Sensory Photobiology
    (b) Amino acids
    (c) Nature of enzyme
    (d) Phytochrome mediated responses

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M.Sc. Botany

Part–II, Paper–X

(Cytogenetics and Crop Improvement)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Define Crossing over. Describe the mechanism of crossing over with its significance.

2. What is Translocation ? What do you mean by heterozygous translocation.

3. Describe the origin, occurrence and production of Aneuploids with suitable examples.

4. Give an account of the structure and significance of β-Chromosomes.

5. What is Mutation ? Give an account of chemical mutagens and their role in induction of mutation.

6. Explain different types of banding patterns. How do these help in recognition of functional differentiation of chromosome segments and their chemical nature ?

7. Write an essay on interaction of genes.

8. Give an account of PCR methodology for gene amplification.

9. Which technique is used for the identification of criminals ?

10. Write notes on any ***Two*** of the following :–
    (a) Transgenic plant
    (b) Protoplast Culture
    (c) Lac Operon
    (d) Genetic engineering

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M.Sc. Botany

Part–II, Paper–XI

(Molecular Biology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Prove that DNA is the genetic material in most of the organisms.
2. Describe the supercoiling in DNA. What are the advantage of supercoiling ?
3. What do you mean by "Mismatch Repair" ? Explain the process as found in E.coli.
4. What are general properties of Genetic Code ? Write about them.
5. Explain different steps in initiation of protein synthesis in prokaryotes.
6. Explain the termination of transcription in prokaryotes in detail.
7. Discuss different points of control of gene expression as found in organisms. Write about induction and repression.
8. Write an essay on one gene one enzyme hypothesis.
9. Describe the concept of prototrophs and auxotrophs.
10. Write notes on any ***Two*** of the following :–
    (a) Bacteriophage
    (b) Nitrogenous bases
    (c) Base excision repair
    (d) Operon

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

Part–II, Paper–XII

(Environmental Biology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Describe the major vegetation of the world.
2. Define ecosystem and describe its components.
3. What is pollution ? Describe the sources of air pollutants and suggest the methods of their control.
4. What is ecological perturbation ? Discuss natural and anthropogenic perturbation and their impact on ecosystem.
5. What is genecology ? Describe various types of ecological groups of population on the bases of their genotypes.
6. Write notes on any ***Two*** of the following :–
   (a) Energy flow concept in ecosystem
   (b) Interaction among population
   (c) Green house effect
   (d) Ozone depletion
7. What are the concept of ecological management ? What are the principles and goals of ecological management ?
8. Describe the vegetational belts of India.
9. What is environmental policy and law ? Discuss its importance in conservation of biodiversity.
10. Write notes on any ***Two*** of the following :–
    (a) Volcano
    (b) Reasons of wildlife conservation
    (c) Soil types of India.
    (d) World Environment Day

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

Part–II, Paper–XIII

(Plant Resource's Utilization and Conservation)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Explain the consequences of Green Revolution in India.
2. Discuss the importance of bio-reserve in conservation.
3. Write an essay on wildlife management with special reference to its need.
4. Write notes on any ***Two*** of the following :–
   (a) Primitive practices reflecting the origin of Agriculture
   (b) Salient features of Green Revolution
   (c) Objectives of DBT
   (d) Objectives of CSIR
5. Write an essay on coral reef.
6. Describe the role of BSI in *in-situ* and *ex-situ* conservation.
7. Discuss the classification of mangrove and its distribution in India.
8. Discuss the objectives and guiding principles of botanical gardens.
9. Give an account of type of fibres and their uses.
10. Give the botanical name of the plants from which the following are extracted/ manufactured.

(a)	Gum rabic	(b)	Teak wood	(c)	Paper	(d)	Coffee
(e)	Hing	(f)	Piperin	(g)	Linseed oil	(h)	Sesame oil
(i)	Mango fruit	(j)	Spinach	(k)	Grape	(l)	Reserpine
(m)	Morphine	(n)	Atropin	(o)	Quinine	(p)	Jute fibre

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

Part–II, Paper–XIV

(Ethnobotany)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. What is Ethnobotany ? Discuss the importance of Ethnobotany.
2. Explain the harmful effect of tobacco leaf. On which particular date "Anti Tobacco Day" is observed throughout the world ?
3. Write the name of at least five medicinal plants. Write down their medicinal properties.
4. Give an account of conservation of endangered and endemic taxa.
5. What are the methods and approaches in germplasm conservation ?
6. Write notes on any ***Two*** of the following :–
   (a) Fibre obtained from plants
   (b) Common spices and condiments
   (c) Modernisation in extraction technique.
   (d) Seed gene banks
7. Give a brief account of any five drug yielding plants you have studied with reference to their uses in pharmaceutical industry.
8. What do you mean by carbohydrates ? Explain its role in nutrition.
9. Give an account of phytogeographical zone of India.
10. Write about ***Two*** of the following :–
    (a) Ethnobotanical centres
    (b) Documentation
    (c) Food source of protein
    (d) Vitamins

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M.Sc. Botany

Part–II, Paper–XV

(Aerobiology)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Describe the detailed structure of Virus.

2. What are allergic diseases ? Describe the symptoms and treatment.

3. Write an essay on aeromycoflora.

4. Give an account of asexual spores of fungi.

5. Discuss the development of fungal spores.

6. Describe the development of pollen grains.

7. Discuss the aerobiology in relation to plant pathology.

8. Write the salient features in brief of the microbial groups.

9. Describe the analytical procedure for viable and non-viable microorganisms.

10. Write notes on any ***Two*** of the following :–
    (a) Air Pollutants
    (b) Crozier formation
    (c) Post pollination development
    (d) Food allergy

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NALANDA OPEN UNIVERSITY

M.Sc. Botany

Part–II, Paper–XVI

(Biotechnology and Bioinformatics)

Annual Examination, 2012

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions. All questions carry equal marks.

1. Describe the role of biotechnology in medicine and agriculture.

2. Write notes on any ***Two*** of the following :—
   (a) Somatic embrogenesis
   (b) Phagemids and Cosmids
   (c) Acclimatization
   (d) Cell mediated immunity

3. Give detailed account of protoplast culture.

4. What do you mean by genetic engineering ? Describe its role in agriculture.

5. What is cryopreservation ? Describe its role in germplasm conservation.

6. Give an account of DNA finger printing.

7. What are enzymes ? What role do they play in biotechnology ?

8. Write an essay on human immune system.

9. Describe the technique and application of microarray technology.

10. Write about ***Two*** of the following :–
    (a) DNA chip
    (b) Rh factor
    (c) Application of enzymes
    (d) Transgenic plant

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