

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-I
(Biodiversity of Plant and Diversity of Algae)
Annual Examination, 2015

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. Give an account of different types of Biodiversity.
2. Describe the utilization of Biodiversity.
3. What do you mean by biogeochemical cycle ? Describe nitrogen cycle in nature.
4. What are the factors responsible for the loss of Biodiversity ?
5. Write short notes on any **Four** of the following:
 - (a) Conservation of Biodiversity
 - (b) Natural Resources
 - (c) Threatened Biodiversity
 - (d) Productivity
 - (e) Mutualism
 - (f) Ecological Pyramid

GROUP 'B'

6. Give an account of the range of vegetative structure of green Algae.
7. Describe the characteristics of cyanophyceae and Rhodophyceae.
8. How will you prove that Algae are economically important ?
9. Give an account of sexual reproduction in green Algae.
10. Write short notes on any four of the following.
 - (a) Symbiotic Algae
 - (b) Algal association with animal
 - (c) Algal Bloom
 - (d) Neurotoxins produced by Algae
 - (e) Akinete
 - (f) Agar-Agar

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Examination Programme, 2015
M.Sc. Botany, Part-I

Date	Paper	Time	Examination Centre
12.05.2015	Paper-I	8.00 AM to 11.00 AM	Nalanda Open University, Patna
14.05.2015	Paper-II	8.00 AM to 11.00 AM	Nalanda Open University, Patna
16.05.2015	Paper-III	8.00 AM to 11.00 AM	Nalanda Open University, Patna
18.05.2015	Paper-IV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
20.05.2015	Paper-V	8.00 AM to 11.00 AM	Nalanda Open University, Patna
22.05.2015	Paper-VI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
26.05.2015	Paper-VII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
28.05.2015	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, 2015

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. Give an account of the structure and reproduction of bacteriophage.
2. Describe the relationship between plasmid and episomes.
3. What do you mean by culture medium ? Describe the types of culture media and also describe the method of preparation of any one of them.
4. Write about any **Two** of the following :-
 - (a) Role of microbes in spoilage of food
 - (b) Characteristics of Mycoplasma
 - (c) Role of microbes in the synthesis of antibiotics
5. Write short notes on any **Four** of the following:
 - (a) Numerical taxonomy
 - (b) Viroid
 - (c) Prion
 - (d) Contribution of Stanley
 - (e) Contribution of Louis Pasteur
 - (f) Nitrifying bacteria

GROUP 'B'

6. Give an account of methods of sexual reproduction in fungi.
7. What is heterothallism ? Describe heterothallism in fungi.
8. Describe asexual reproduction in the subdivision Mastigomycotina.
9. Write about the cultivation of mushrooms.
10. Write short notes on any **Four** of the following.
 - (a) Zygosporangium
 - (b) Saprophytes
 - (c) Germination of teleutospore
 - (d) Mycotoxins
 - (e) Somatogamy
 - (f) Apothecium

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-III
(Plant Pathology)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions.
All questions carry equal marks.

1. How do the pathogen secreted enzymes play role in pathogenesis ?
2. Do you agree that phytoalexins play role in defence against plant disease ?
3. Classify plant diseases considering different grounds.
4. Write notes on any four of the following.
 - (a) Contribution of Prof. Millardet
 - (b) Phytotoxin
 - (c) Alternate host
 - (d) Hot Water Treatment
 - (e) Contribution of Prof. K.C. Mehta
 - (f) Important plant disease of Bihar State and their pathogens
5. Describe the systemic fungicides.
6. Define quarantine with respect to plant disease. Discuss the mechanism of plant quarantine and its organization in our country.
7. Describe the symptoms, causal organism, disease cycle and control of blast of rice.
8. Describe the symptoms, causal organism, disease cycle and control of Tikka disease of groundnut.
9. What measures will you apply for the control of citrus cancer, Little leaf of brinjal and Loose Smut of wheat.
10. Write short notes on any four of the following.
 - (a) Organomercuriales
 - (b) Fungicides
 - (c) Antagonism
 - (d) Abscission layer
 - (e) Organic amendment of soil
 - (f) Crop rotation

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-IV
(Biology and diversity of Bryophyta and Pteridophyta)
Annual Examination, 2015

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 general characters of Bryophyta.
2. What are the salient features of the order Marchantiales and what are its affinities ?
3. Describe the economic importance of Bryophyta.
4. Give an account of the structure and reproduction of *Takakia*
5. Write short notes on any **Four** of the following :-
 - (a) Sporophyte of Riccia
 - (b) Columella
 - (c) Elater
 - (d) Capsule of Anthoceros
 - (e) Gemma
 - (f) Moss

GROUP 'B'

6. Give an account of the characteristics of different divisions of Pteridophyta as suggested by N.S. Parihar.
7. Describe the origin of seed habit.
8. Describe steles found in Pteridophyta.
9. Describe the spore producing organ of Psilotaceae.
10. Write about **Two** of the following.
 - (a) Rhyniophyta
 - (b) Sorus
 - (c) Siphonostete
 - (d) spore producing organ of *Equisetum*.

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-V
(Diversity of seed plants and their taxonomy)
Annual Examination, 2015

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. Classify Gymnosperm upto the level of Classes.
2. Give an account of reproductive organs of *Williamsonia*.
3. Describe the male reproductive organ of *Cycadeoidea*.
4. Give an account of the development of female gametophyte of *Cycas*, *Pinus* and *Taxus*.
5. Write short notes on any **Two** of the following:-
 - (a) Phylogeny of Cycadales
 - (b) Seed of Bennettitales
 - (c) Distribution of Gnetales
 - (d) Medicinal use of Gymnosperm

GROUP 'B'

6. Give a brief account of the pre-Linnaean and post-Linnaean system of classification of Angiosperm.
7. Describe the system of classification of Angiosperm as proposed by Cronquist.
8. Describe the family Papilionaceae in details.
9. Discuss the phylogeny of the family Magnoliaceae.
10. Write about **Two** of the following.
 - (a) Herbarium
 - (b) ICBN
 - (c) Cytotaxonomy
 - (d) Natural system of classification

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-VI
(Management of Forest Resources)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions.
All questions carry equal marks.

1. Describe the causes of decline of forest and also mention its conservation.
2. Explain the forest resources.
3. Describe the drugs and spices obtained from the forest.
4. Write notes on any **Two** of the following :-
(a) Forest Product (b) Afforestation
(c) Decomposers of forest ecosystem (d) Agroforestry
5. How can a disease free plant be obtained through meristem culture ?
6. Describe the main objectives of tree improvement.
7. What are cultch and Katha ? Describe the methods of their extraction.
8. Give an account of the methods of regeneration.
9. What are different methods of plantation in India.
10. Write short notes on any **Four** of the following.
(a) Shifting Cultivation (b) Food from forest
(c) Barrier to pollen exchange (d) Deciduous forest
(e) MAB (f) Mangrove forest

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-VII
(Cell Biology)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions.
All questions carry equal marks.

1. What is biogenesis ? Explain in brief the modern concept of origin of life.
2. Give an account of the ultrastructure of mitochondria and its function.
3. Describe the structure and function of peroxisome.
4. What do you mean by cell division ? Describe the mitosis in details with its significance.
5. Mention the role played by Gap junction and plasmodesmata in intercellular communication.
6. Describe the ecological amplitude of cell in arid environment.
7. What is senescence of a cell ? Describe the changes that occur in a cell during senescence.
8. Give an account of the structure of double helix model of DNA.
9. Explain the phenomenon of differentiation in plants.
10. Write notes on any **Two** of the following :-
 - (a) Viral chromosome
 - (b) Structure and function of nucleolus
 - (c) Nitrogenous base
 - (d) Pachytene

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-VIII
(Plant Anatomy and Embryology)
Annual Examination, 2015

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. What do you mean by meristematic tissue ? Give the characteristics features of the meristematic tissue.
2. Give an organization of root apical meristem.
3. Write short notes on any **Four** of the following:-
 - (a) Symmetry of flowers
 - (b) Polarity
 - (c) Meristematic potential of cells
 - (d) Dermatogen
 - (e) Cuticle
 - (f) Vascular bundle of monocot stem.
4. Discuss the contribution of floral anatomy in solving the taxonomic position of disputed taxa.
5. Describe the classification of stomata.

GROUP 'B'

6. Describe the pollen tube growth through the pistil.
7. Describe the causes of polyembryony and its role in plant breeding.
8. Describe the process of embryo culture and its application.
9. Illustrate the technique of ovary, ovule and endosperm culture and also mention its advantage.
10. Write short notes on any **Four** of the following:-
 - (a) Dichogamy
 - (b) Function of seed coat
 - (c) Classification of seed
 - (d) Adventive embryony
 - (e) Hypogeal germination of seed
 - (f) Chemically induced parthenocarpy

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For Practical Counselling Class & Practical Examination Programme Please See on Back Page.

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–IX
(Plant Physiology and Biochemistry)
Annual Examination, 2015

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. Give an account of the physiology of flowering .
2. What do you understand by vernalization ? Give some practical uses of this phenomenon.
3. Give an illustrated account of the induced movements in plants.
4. Describe the fixation of CO₂ in dark phase reaction of photosynthesis leading to the formation of Fructose-6-P.
5. What is stress ? Give a brief account of water and salt stress in plants.

Or,

Write notes on any **Two** of the following :—

- (a) Active Transport
- (b) Phototropism
- (c) Geotropism
- (d) CAM

GROUP 'B'

6. What is an enzyme ? Give an account of nomenclature and classification of enzyme.
7. Define biomolecules and justify that carbohydrates are biomolecules.
8. Describe the formation of pyruvic acid from glucose.
9. Describe some phytochrome mediated responses in plants.
10. Write short notes on any **Two** of the following :—
 - (a) Cytochrome
 - (b) Chlorophyll
 - (c) Exothermic and endothermic reactions
 - (d) Nitrogen containing secondary metabolites

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Examination Programme, 2015
M.Sc. Botany, Part-II

Date	Papers	Time	Examination Centre
06.06.2015	Paper-IX	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
08.06.2015	Paper-X	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
10.06.2015	Paper-XI	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
12.06.2015	Paper-XII	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
16.06.2015	Paper-XIII	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
18.06.2015	Paper-XIV	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
20.06.2015	Paper-XV	12.00 Noon to 3.00 PM	Nalanda Open University, Patna
22.06.2015	Paper-XVI	12.00 Noon to 3.00 PM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-X
(Cytogenetics and crop improvement)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Define crossing over. Describe the mechanism and types of crossing over.
2. Give an account of human genetic disorders arising from addition and deletion of chromosomes.
3. Give an account of the structure and significance of supernumerary chromosomes.
4. Describe the role of mutation in speciation, evolution and crop improvement.
5. Explain different types of banding patterns. How do these help in recognition of functional differentiation of chromosome segments and their chemical nature?
6. Give an detailed account on sex linkage in *Drosophila*.
7. Give an account of PCR methodology for gene amplification purpose.
8. Explain gene regulation in Prokaryotes.
9. What do you mean by transgenic plant? Give details of about transgenic plant.
10. Write notes on any **Two** of the following:–
 - (a) Plasmid as Vector
 - (b) High iron rice
 - (c) Blotting technique
 - (d) Dominant epistasis

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XI
(Molecular Biology)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe the Watson and Crick model of DNA.
2. What do you mean by transformation Principles ?
3. Give an account of nucleosome.
4. In what way DNA differs from RNA ?
5. Describe the role of RNA in DNA replication.
6. Describe the DNA dependent RNA biosynthesis.
7. Give an account of different steps in initiation of protein synthesis in Prokaryotes.
8. What do you understand by Transposons ? In what way they help in the rearrangement of the genome ?
9. Give an account of Split gene and overlapping genes.
10. Write short notes on any **Two** of the following :-
 - (a) Cistron
 - (b) Bacterial Operon
 - (c) Steps in activation of amino acids
 - (d) Significance of DNA repair.

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-XII
(Environmental Biology)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe the major vegetation of the World.
2. Write the productivity of ecosystem and mention the method of its measurement.
3. Define population and mention the characteristics of population of organisms.
4. Describe the sources of water pollution and write the methods of its control.
5. Explain biogeochemical cycle and the details of nitrogen cycle in nature.
6. In what way the anthropogenic perturbation is responsible for the loss of biodiversity ?
7. What is Genecology ? Describe the various types of ecological groups of population on the basis of their genotype.
8. What do you mean by Red Data Categories ? Explain the main conservation categories.
9. Acquaint with natural disasters and write how to mitigate their hazards.
10. Write short notes on any **Four** of the following :-
 - (a) Forest ecosystem
 - (b) Mutualism
 - (c) Acid rain
 - (d) Types of ecotype
 - (e) Carbon cycle
 - (f) Reasons for wildlife conservation

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XIII
(Plant Resources, Utilization and Conservation)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe the causes of loss of biodiversity.
2. Describe the world centre of diversity of cultivated plants.
3. Mention the need to establish ICAR and its activities.
4. Explain the term wetland and give reasons of its depletion and the methods of its conservation.
5. What are the principles and strategy of *ex situ* conservation ?
6. Write notes on any **Two** of the following :-
 - (a) Vivipary
 - (b) Importance of National Park
 - (c) Need of wildlife protection
 - (d) Objectives of BSI
7. Describe the methodology of protoplast fusion and production of somatic hybrid.
8. Write the common English name and Botanical name of three plants each of cereals, pulses and oil yielding crops and their dietary importance.
9. Describe the methods of germplasm conservation.
10. In which state the following National Parks are located and for which these are popularly known?
 - (a) Dudhwa National Park
 - (b) Desert National Park
 - (c) Kanha National Park
 - (d) Kaziranga National Park
 - (e) Betla National Park
 - (f) Mahatma Gandhi National Park
 - (g) Hazaribagh National Park
 - (h) Kudremukh National Park

Or

Which of the following plants are known for rich amount of starch, protein, oil, fibre, timber and aromatic compounds ?

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|--|---------------------------------------|
| (a) <u><i>Brassica campestris</i></u> | (b) <u><i>Arachis hypogea</i></u> |
| (c) <u><i>Corchorus capsularis</i></u> | (d) <u><i>Cajanus cajan</i></u> |
| (e) <u><i>Cinnamomum tamala</i></u> | (f) <u><i>Cuminum cyminum</i></u> |
| (g) <u><i>Dalbergia sissoo</i></u> | (h) <u><i>Gossypium herbaceum</i></u> |
| (i) <u><i>Oryza sativa</i></u> | (j) <u><i>Pisum sativum</i></u> |
| (k) <u><i>Ferula asafoetida</i></u> | (l) <u><i>Vigna mungo</i></u> |
| (m) <u><i>Sesamum indicum</i></u> | (n) <u><i>Vicia faba</i></u> |
| (o) <u><i>Tectona grandis</i></u> | (p) <u><i>Zea mays</i></u> |

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XIV
(Ethnobotany)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What do you mean by Ethnobotany ? Mention its scope in details.
2. Write the uses of any **four** of the following :-
 - (a) *Asparagus officinalis*
 - (b) *Allium cepa*
 - (c) *Calendula officinale*
 - (d) *Centella asiatica*
 - (e) *Rauwolfia serpentina*
 - (f) *Zingiber officinale*
3. Describe the common spices and condiments and their importance.
4. What do you mean by lipids ? Write their characteristic features and role in nutrition.
5. Write notes on any **Four** of the following :-
 - (a) Source of plant protein
 - (b) Glucose
 - (c) Drug group
 - (d) Kwath
 - (e) Pharmacology
 - (f) Medicinal plants of Liliaceae
6. Mention the importance of indigenous medicinal plants.
7. Describe the methods of storage of herbal drugs.
8. Mention the *ex situ* conservation strategies.
9. What are Vitamins ? Describe the sources of different vitamins.
10. What do you mean by centres of origin ? How does it differ from the centre of production ?

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XV
(Aerobiology)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Mention Whittaker's contribution towards the classification of living beings. Also describe the characteristics of different groups.
2. Give details of the aeromycoflora.
3. Compare the structure of the Prokaryotic and Eukaryotic cells.
4. Mention the salient features of any Four of the following :-
 - (a) Algae
 - (b) Fungi
 - (c) Bacteria
 - (d) Virus
 - (e) Mycoplasma
 - (f) Rickettsias
5. Give an account of the sources of allergy and describe the allergic response.
6. Describe the development of male gametophyte.
7. Describe the structure and type of spores in different groups of fungi.
8. Describe the post-fertilization changes leading to the formation of ascospore.
9. Do you agree with the statement that Aerobiology is the discipline of Biology relevant to the human and plant health ?
10. Write note on any **Four** of the following :-
 - (a) Immunity
 - (b) Food Allergy
 - (c) Structure of pollen grain
 - (d) Aeromicrobiology
 - (e) Air sampling technique
 - (f) Air pollutant

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**For Practical Counselling Class & Practical Examination Programme
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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-XVI
(Biotechnology and Bioinformatics)
Annual Examination, 2015

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Mention the traditional and modern concept of Biotechnology.
2. What are somatic hybrids ? In What way these are helpful in crop improvement ?
3. What do you mean by explant ? How will you induce callus formation ?
4. give an account of DNA finger printing.
5. What are enzymes ? what role do they play in biotechnology ?
6. What is micropogagation ? Describe the technique of clonal propagation.
7. What do you mean by Polymerase Chain Reaction ? Describe its application for human welfare.
8. What T and B lymphocytes ? Describe their role in immunity.
9. What are secondary metabolites ? Describe the role of *in vitro* plant tissue culture in the production of secondary metabolites.
10. Write note on any **Two** of the following :-
 - (a) Anther and pollen culture
 - (b) Genetic counselling
 - (c) Phagemid and cosmid
 - (d) Use of bioinformatic tools

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**For Practical Counselling Class & Practical Examination Programme
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