

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-I, PAPER-I**  
**(Biodiversity of Plant and Diversity of Algae)**  
**Annual Examination, 2014**

**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 understand by Biodiversity? Describe its evolution.
2. Explain the conservation and management of Biodiversity.
3. Define ecosystem. Give an account of structure and function of the ecosystem.
4. Explain the term Hot Spot and the main criteria for determining a Hot Spot.
5. Write short notes on any two of the following:
 

(a) Genetic diversity	(b) Natural resources
(c) Threatened categories	(d) Productivity

**GROUP 'B'**

6. Describe the asexual reproduction in green algae.
7. Give an account of classification of chlorophyceae as proposed by Fritsch.
8. What do you understand by toxic algae? Also, describe its role in human life.
9. Describe the sexual reproduction in Phaeophyceae.
10. Write short notes on any four of the following.
 

(a) Algae as food	(b) Algae as fertilizer
(c) Algae as nitrogen fixer	(d) Akinete
(e) Kelp	(f) Symbiotic cyanophyceae

\* \* \*

**Examination Programme, 2014**  
**M.Sc. Botany, Part-I**

<i>Date</i>	<i>Paper</i>	<i>Time</i>	<i>Examination Centre</i>
05.07.2014	Paper-I	8.00 AM to 11.00 AM	Nalanda Open University, Patna
07.07.2014	Paper-II	8.00 AM to 11.00 AM	Nalanda Open University, Patna
09.07.2014	Paper-III	8.00 AM to 11.00 AM	Nalanda Open University, Patna
11.07.2014	Paper-IV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
15.07.2014	Paper-V	8.00 AM to 11.00 AM	Nalanda Open University, Patna
17.07.2014	Paper-VI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
19.07.2014	Paper-VII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
21.07.2014	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, 2014*

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 structure and method of replication of virus.
2. Give the structure of a typical bacterial cell.
3. Describe the distinguishing features of transformation, transduction and conjugation.
4. Give an account of the harmful role played by the microbes.
5. Write short notes on any two of the following:  
(a) Culture media                                  (b) Gram staining  
(c) contribution of Bawden                      (d) Contribution of Louis Pasteur

**GROUP 'B'**

6. Enumerate the features of different classes of Fungi as proposed by Gwynne-Vaughan and Barnes.
7. Describe the sex hormones found in Fungi.
8. What is parasexuality? Describe the parasexual cycle in fungi.
9. Write an essay on mycotoxins.
10. Write short notes on any four of the following.  
(a) Zoospores                                      (b) Zygosporangium  
(c) Nutritive value of mushroom          (d) Fruit bodies of Ascomycetes  
(e) Dikaryotic mycelium                      (f) Fungi in industries.

\* \* \*

**NALANDA OPEN UNIVERSITY**

**M.Sc. Botany**

***PART-I, PAPER-III***

**(Plant Pathology)**

***Annual Examination, 2014***

**Time : 3 Hours.**

**Full Marks : 80**

***Answer any Five Questions. All questions carry equal marks.***

1. Classify the types of plant diseases on different criteria.
2. Discuss the role of toxins in pathogenesis.
3. Describe the post-infectious structural defence.
4. Do you agree that the plants contains some bichemicals for their defence against pathogens in pre-infectious stage? If yes, give its detailed account.
5. What do you mean by biological control of plant disease? Give an account of the control of soilborne plant diseases by the application of microbes.
6. Describe the microbial interaction in rhizosphere with reference to root diseases.
7. Give an account of organic fungicides.
8. Describe the symptoms, etiology, disease cycle and the control of loose smut of wheat.
9. Write the symptoms, etiology, disease cycle and control of late blight of potato.
10. Write short notes on any four of the following.
  - (a) Contribution of Robert Koch
  - (b) Disease escape
  - (c) Antibiotics
  - (d) Soil amendment

\* \* \*

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-I, PAPER-IV**  
**(Biology and diversity of Bryophyta and Pteridophyta)**  
**Annual Examination, 2014**

Time : 3 Hours.

Full Marks : 80

*Answer Five Questions. Selecting at least two questions -  
from each group. All question carry equal marks.*

**Group-A**

1. Based on the characteristics classify bryophyta up to the level of orders.
2. Describe the characteristic features of Jungermanniales and discuss its affinity.
3. Describe the Vegetative propagation and perennation in Bryophyta.
4. Give an account of reproduction in Calobryales and its affinity.
5. Write notes on any two of the following:
  - (a) Medicinal use of Bryophyta
  - (b) Columella
  - (c) Sporophyte of Marchantiales
  - (d) Gemetophyte of Metzgeriales

**Group-B**

6. What is seed habit? Describe its origin with reference to Selaginella.
7. Describe the salient features in anatomy and reproduction in Psilotum.
8. Describe the structure of spore producing organ and its morphological nature in Ophioglossum.
9. Discuss the leptosporangiate mode of development.
10. Write short notes on any two of the following:
  - (a) Actinostele
  - (b) Equisetophyta
  - (c) Cyathea
  - (d) Sorus

\* \* \*

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-I, PAPER-V**  
**(Diversity of Seed Plants and their Taxonomy)**  
**Annual Examination, 2014**

Time : 3 Hours.

Full Marks: 80

*Answer Five Questions. Selecting at least two questions -  
from each group. All question carry equal marks.*

**Group-A**

1. Describe the medicinal use of Gymnosperms.
2. Give an account of Cordainthus and its affinity.
3. Write about two of the following :—
  - (a) Geological record of Gymnosperm.
  - (b) Difference between Gymnosperm and Angiosperm.
  - (c) Female fructification of Lagenostoma
  - (d) Ovule of Bennettites.
4. Describe the development of male gametophyte of cycas, Pinus and Taxus.
5. Write notes on any two of the following :—
  - (a) Edible product obtained from Gymnosperm
  - (b) Coralloid root
  - (c) Affinity of Gymnosperm with Pteridophyta
  - (d) Sperm of Cycas

**Group-B**

6. Describe about the various aspets of phylogenetic system of classification.
7. Give an account of Takhtajan system of classification of Angiosperm. Mention its merits and demerits.
8. Describe the floral characters of Alismaceae, its systematics and phylogeny.
9. What do you mean by herbarium ? Describe the importance of herbaria in modern taxonomic research. Give an acquaintance with Central National Herbarium, Howrah.
10. Write about two of the following:
  - (a) Significance of pollen morphology as tool in taxonomic categorisation of Angiosperm.
  - (b) Significance of Secondary metabolite in Angiosperm taxonomy
  - (c) Basis of division of Fabales in three families
  - (d) National Botanical Garden.

\* \* \*

<p><b><i>For Practical Counselling Class &amp; Practical Examination Programme Please See on Back Page.</i></b></p>
---

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-I, PAPER-VI**  
**(Management of Forest Resources)**  
*Annual Examination, 2014*

**Time : 3 Hours.**

**Full Marks: 80**

*Answer Five Questions. All question carry equal marks.*

1. Mention forest resources in details.
2. Describe the benefits of forest.
3. Give an account of forest ecosystem.
4. How can the forest resources be controlled and managed?
5. Give an account of the classification of forest soil.
6. Explain the role of agroforestry in India.
7. Discuss the use of somatic embryogenesis.
8. Give an account of vegetative propagation of forest plants.
9. What is protoplast culture? How is it advantageous for forest tree improvement?
10. Write short notes on any four of the following:
  - (a) Causes of decline of forest
  - (b) Drug from underground part of plants
  - (c) Alpine forest
  - (d) Mechanical properties of wood
  - (e) Lac
  - (f) Deforestation

\* \* \*

<p><b><i>For Practical Counselling Class &amp; Practical Examination Programme Please See on Back Page.</i></b></p>
---

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany

### PART-I, PAPER-VII

### (Cell Biology)

Annual Examination, 2014

Time : 3 Hours.

Full Marks: 80

*Answer Five Questions. All question carry equal marks.*

1. Give an experimental proof in support of biochemical theory of origin of life.
2. What is plasma membrane? Describe the fluid mosaic model of plasma membrane.
3. Give an account of the chemical nature of cytoplasm.
4. Describe the detailed structure of nucleus.
5. Describe the detailed structure of the plastid meant for photosynthesis.
6. What are carcinogens? Describe the causes of cancer.
7. Describe prophase I of meiotic cell division and write its significance.
8. Discuss the role of cycle AMP in cell interaction.
9. What do you mean by ecological amplitude? Describe ecological amplitude in the cell under fresh water environment.
10. Write short notes on any Two of the following:
  - (a) Prokaryotic chromosome
  - (b) ds RNA
  - (c) Cell cycle
  - (d) Paper chromatography

\* \* \*

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

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-I, PAPER-VIII**  
**(Anatomy and Embryology)**  
**Annual Examination, 2014**

Time : 3 Hours.

Full Marks: 80

*Answer Five Questions. Selecting at least two questions from each group.*

*All question carry equal marks.*

**Group-A**

1. Discuss the classification of meristem.
2. What is Symmetry ? Describe the symmetry of flower
3. Describe the internal factors of differentiation.
4. Give an account of Vasculature of typical dicot flower.
5. Write notes on any **Four** of the following :—
  - (a) Wound Healing
  - (b) Cambium
  - (c) Guard Cell
  - (d) Leaf Gap
  - (e) Anomocytic Type of Stomata
  - (f) Sclereids

**Group-B**

6. Describe different barriers to fertilization and the methods to overcome them.
7. Describe the development of embryo from the cells other than the egg cell.
8. Describe the technique and advantage of ovary, ovule and endosperm culture.
9. Discuss the production of haploid through anther culture.
10. Write notes on any **Two** of the following :-
  - (a) Syngamy
  - (b) Helobial type of endosperm
  - (c) Parthenocarpy
  - (d) Parts of a seed

\* \* \*

<p><b><i>For Practical Counselling Class &amp; Practical Examination Programme</i></b> <b><i>Please See on Back Page.</i></b></p>
---



**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-II, PAPER-IX**  
**(Plant Physiology and Biochemistry)**  
**Annual Examination, 2014**

Time : 3 Hours.

Full Marks: 80

*Answer Five Questions in all, selecting at least two questions from each group.*

*All question carry equal marks.*

**Group-A**

1. What is permeability of biomembrane ? Discuss its mechanism.
2. Give critical account of the physiology of flowering.
3. Give and account of the light reaction of photosynthesis.
4. Write in brief about the causes of dormancy of seed and describe two methods of breaking the dormancy.
5. Write notes on any **Two** of the following :—
  - (a) Phototropism
  - (b) Biochemical effects of draught
  - (c) Temperature stress in plants
  - (d) Change in stored product of seed at germination.

**Group-B**

6. Give an account of vitamins.
7. What is Krebs cycle? Give stepwise reactions of Krebs cycle and also mention the outcome of ATP in the cycle.
8. Explain biological nitrogen fixation. Describe the role of microbes in nitrogen fixation.
9. Define secondary metabolite. Give details of different types of secondary metabolite.
10. Write notes on any **Two** of the following:-
  - (a) Electron transport system
  - (b) Transamination
  - (c) First law of thermodynamics
  - (d) Commercial value of secondary metabolite.

\* \* \*

**Examination Programme, 2014**

**M.Sc. Botany, Part-II**

<b>Date</b>	<b>Paper</b>	<b>Time</b>	<b>Examination Centre</b>
14.08.2014	Paper-IX	8.00 AM to 11.00 AM	Nalanda Open University, Patna
16.08.2014	Paper-X	8.00 AM to 11.00 AM	Nalanda Open University, Patna
20.08.2014	Paper-XI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
22.08.2014	Paper-XII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
26.08.2014	Paper-XIII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
28.08.2014	Paper-XIV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
30.08.2014	Paper-XV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
01.09.2014	Paper-XVI	8.00 AM to 11.00 AM	Nalanda Open University, Patna

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-II, PAPER-X**  
**(Cytogenetic and Crop Improvement)**  
**Annual Examination, 2014**

**Time : 3 Hours.**

**Full Marks: 80**

**Answer Five Questions in all, selecting at least two questions from each group.**

**All question carry equal marks.**

1. What is translocation? Describe heterozygous translocation.
2. Define polyploidy and describe their origin, types and significance.
3. Describe molecular mechanism of mutation.
4. Describe the application of banding technique.
5. Give an account of interaction of two genes.
6. Discuss PCR methodology for gene amplification.
7. Describe the technique used for the identification of criminals.
8. Describe the chromosomal constitution and sex determination in some dioecious plants.
9. Define monosomy. Describe human genetic disorder arising from monosomy.
10. Write notes on any **Two** of the following:-
  - (a) Incomplete dominance
  - (b) Plasmid as Vector
  - (c) Genetic engineering and agriculture
  - (d) Significance of - $\beta$  chromosome.

\* \* \*

**NALANDA OPEN UNIVERSITY**

**M.Sc. Botany**

***PART-II, PAPER-XI***

**(Molecular Biology)**

***Annual Examination, 2014***

**Time : 3 Hours.**

**Full Marks: 80**

***Answer Five Questions. All questions carry equal marks.***

1. How did the phage infection prove that DNA was the genetic material of viruses?
2. Discuss different steps involved in initiation of DNA synthesis in *E. Coli*. Also mention the role of different enzymes in this process.
3. What do you mean by "Mismatch Repair"? Describe the process as observed in *E.Coli*.
4. What are the general properties of the genetic code?
5. Describe the amino acid activation stage of protein biosynthesis and the role of aminoacyl-tRNA synthetase in translation.
6. Discuss different eukaryotic promoters of transcription and their role in gene regulation.
7. What do you mean by pseudogenes?
8. Write an essay on one gene one enzyme hypothesis.
9. Discuss the concept of prototrophs and auxotrophs.
10. Write notes on any **Two** of the following:-
  - (a) Nitrogenous base
  - (b) Bacteriophage
  - (c) Wobble hypothesis
  - (d) Selfish gene.

\* \* \*

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-II, PAPER-XII**  
**(Environmental Biology)**  
**Annual Examination, 2014**

Time : 3 Hours.

Full Marks: 80

*Answer Five Questions. All questions carry equal marks.*

1. Discuss climatic factors and the effect of climate on the form, structure and distribution of plants.
2. Give detailed account of the forest ecosystem.
3. Discuss the sources of air pollutants and describe the methods of their control.
4. Answer the following in the light of environmental biology:
  - (a) The use of drinking water from the shallow boring is not advisable. Why?
  - (b) Chewing of tobacco and spitting at places must be banned. Why?
  - (c) Refuse of the hospital must not be thrown roadside. Why?
  - (d) Electric trains are eco-friendly as compared to diesel trains. Why so?
5. Write notes on any two of the following:
  - (a) Ozone depletion
  - (b) Energy flow concept in ecosystem
  - (c) Green house effect
  - (d) Interaction among population
6. What steps can be taken to generate awareness in people for the need of biodiversity conservation.
7. What is ecological perturbation? Describe natural and anthropogenic perturbation and their impact on ecosystem.
8. Describe the vegetational belt of India.
9. Describe various types of ecological groups of population on the basis of genotype.
10. Write notes on any **Two** of the following:-
  - (a) Landslide
  - (b) Flood
  - (c) World Environmental Day
  - (d) Reasons of wildlife conservation.

\* \* \*

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-II, PAPER-XIII**  
**(Plant Resources, Utilization and Conservation)**  
**Annual Examination, 2014**

Time: 3 Hours.

Full Marks: 80

*Answer Five Questions. All questions carry equal marks.*

1. Define biodiversity and explain in details the species, genetic and ecosystem diversity.
2. Discuss the consequences of Green Revolution.
3. Describe the relationship between agriculture and civilization.
4. Write an essay on National Park and its significance.
5. Describe the classification of Mangrove and its distribution in India.
6. What is tissue culture? Describe its objectives in details.
7. Describe the role of BSI in *in-situ* and *ex-situ* conservation.
8. What are fibres? Describe the types of fibre and their uses.
9. What do mean by cereals? Discuss their importance in relation to human health.
10. Write notes on any **Two** of the following:-
  - (a) Paper
  - (b) Endangered plant
  - (c) Gene bank
  - (d) Protoplast culture

\* \* \*

<p><b><i>For Practical Counselling Class &amp; Practical Examination Programme Please See on Back Page.</i></b></p>
---

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany

### PART-II, PAPER-XIV

### (Ethnobotany)

Annual Examination, 2014

Time: 3 Hours.

Full Marks: 80

*Answer Five Questions. All questions carry equal marks.*

1. Explain Ethnobotany as a discipline of Botany. Describe its importance.
2. Give an account of important fibres obtained from the plants along with their uses in industry.
3. Write notes on any four of the following :—
  - (a) History of Ethnobotany
  - (b) Traditional system of use of the herbs
  - (c) Endemic distribution
  - (d) Conservation of medicinal plants
4. Write the medicinal use of any four of the following :—

(a) Sarpagandha	(b) Cumin
(c) Turmeric	(d) Garlic
(e) Asparagus	(f) Aswagandha
5. Write the methods and approach of germplasm conservation.
6. What are proteins? Give its characteristic features and role in human nutrition.
7. Write notes on any four of the following :—

(a) Minerals	(b) Sources of edible oil
(c) Sources of plant protein	(d) Vitamin C
(e) Vitamin D	(f) Awaleh
8. Give an account of any five drug yielding plants you have studied with reference to their use in pharmaceutical industry.
9. Write an essay on centres of Ethnobotany in India.
10. Write notes on any **Two** of the following:-
  - (a) Training organisation
  - (b) Documentation
  - (c) Pharmacology
  - (d) Seed gene bank

\* \* \*

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

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany PART-II, PAPER-XV (Aerobiology) Annual Examination, 2014

Time: 3 Hours.

Full Marks: 80

*Answer Five Questions. All questions carry equal marks.*

1. Describe the detailed structure of virus.
2. What are microorganisms ? On what characteristics their taxonomic position is decided in the living world ?
3. Eukaryotic cells differ from prokaryotic cells. On what grounds ?
4. Describe the aeromycoflora.
5. Give an account of asexual spores of fungi.
6. What do you understand by aerobiology.
7. Describe microsporogenesis.
8. Describe aerobiology in relation to plant pathology.
9. Describe the analytical procedure for the identification of viable and non-viable microorganisms.
10. Write notes on any **Two** of the following:-
  - (a) Post-pollination development.
  - (b) Crozier formation.
  - (c) Air pollutants.

\* \* \*

<p><b><i>For Practical Counselling Class &amp; Practical Examination Programme Please See on Back Page.</i></b></p>
---

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany**  
**PART-II, PAPER-XVI**  
**(Biotechnology and Bioinformatics)**  
**Annual Examination, 2014**

**Time: 3 Hours.**

**Full Marks: 80**

***Answer Five Questions. All questions carry equal marks.***

1. Describe the role of Biotechnology in medicine and agriculture.
2. Describe the method of sterilization.
3. What is androgenesis? Describe its technique and application.
4. What is somatic hybridization? Describe its application and limitations.
5. Give an account of cryopreservation in germ plasm conservation.
6. What are plasmids? How do they work as cloning vector?
7. Describe the role of genetic engineering in agriculture.
8. How can the plant transformation be achieved by Agro bacterium?
9. Give an account the technique and application of microarray technology.
10. Write notes on any **Two** of the following:-
  - (a) Transgenic plant
  - (b) Protoplast Culture
  - (c) Polarity
  - (d) Cybrid

\* \* \*

<b><i>For Practical Counselling Class &amp; Practical Examination Programme Please See on Back Page.</i></b>
--