

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-I**  
**PAPER-I**  
(Biodiversity of Plant and Diversity of Algae)  
*Annual Examination, 2020*

**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 factors responsible for decline of biodiversity.
2. Mention different values of Biodiversity. Why are they important ?
3. Describe different methods for calculation of productivity in a ecosystem.
4. What is biogeochemical cycle ? Describe any one type of biogeochemical cycle in detail.
5. Write short notes on any **Two** of the following :-
  - (a) Structure of an ecosystem
  - (b) Hot spot and its significance
  - (c) Food chain
  - (d) Natural resources

**GROUP 'B'**

6. Describe in detail economic importance of algae.
7. Describe ultrastructure of Cyanophycean cell.
8. What is Isomorphic alternation of generation mention citing example of *Ectocarpus* ?
9. Write short notes on any **Four** of the following :-
  - (a) Role of Pyrenoids
  - (b) Different types of Sexual reproduction in Algae
  - (c) Akinete
  - (d) Parasitic algae
  - (e) Kelp (Sea)
  - (f) Aplanospore
  - (g) Algae as fertilizer
10. Describe how heterotrichous habit leads to land habit in Chlorophyceae.

\* \* \*

M.Sc. Botany, Part-I  
Programme for Practical Counselling Classes and Practical Examination, 2020  
Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna

**Practical Counselling Class Programme (Only for Old Batch Students)**

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students	<b>B1</b>	29.04.2021 & 30.04.2021	I to VIII	10.30 AM to 5.00 PM

**Practical Examination Programme (Only for Old Batch Students)**

<i>Date</i>	<i>Time</i>							
	<b>9.30 AM to 11.30 AM</b>		<b>11.30 AM to 1.30 PM</b>		<b>2.00 PM to 4.00 PM</b>		<b>4.00 PM to 6.00 PM</b>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
03.05.2021	B1	I	B1	II	B1	III	B1	IV
04.05.2021	B1	V	B1	VI	B1	VII	B1	VIII

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-I

### PAPER-II

(Microbiology and Diversity of Fungi)

Annual Examination, 2020

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 is Genetic recombination in Bacteria ? Describe Transduction in detail.
2. Describe role of Bacteria in Industries.
3. Describe method for preparation of culture media (any one) for growth of Bacteria.
4. Describe Ultrastructure of TMV or Describe method for Gram staining in Bacteria.
5. Write short notes on any **Two** of the following :-
  - (a) Kochs postulate
  - (b) Contribution of Louis Pasteur
  - (c) Conjugation in Bacteria
  - (d) Antibiotics produced by Bacteria

#### GROUP 'B'

6. Give an account of Para sexuality in Fungi. What is its significance.
7. Describe method for cultivation of edible Mushrooms.
8. Describe the life cycle of Puccinia on different host.
9. Write short notes on any **Two** of the following :-
  - (a) Apothecia
  - (b) Fungi in Industries
  - (c) Life cycle of Albugo (Diagrammatic)
  - (d) Life Cycle of any Smut Disease
10. Give an account of Mycotoxin. What is their significance in Human health ?

\* \* \*

#### M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2020

Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Classes Programme

Enrollment No.	Batch	Date	Paper	Time
All Old students 190260001 to 190260054	<b>B1</b>	29.04.2021 & 30.04.2021	I to VIII	10:30 AM to 05:00 PM
190260055 to 190260123	<b>B2</b>	05.05.2021 & 06.05.2021	I to VIII	10:30 AM to 05:00 PM
190260124 to 190260184	<b>B3</b>	07.05.2021 & 08.05.2021	I to VIII	10:30 AM to 05:00 PM
190260185 to 190260278	<b>B4</b>	16.05.2021 & 17.05.2021	I to VIII	10:30 AM to 05:00 PM

#### Practical Examination Programme

Date	Time							
	09:30 AM to 11:30 AM		11:30 AM to 01:30 PM		02:00 PM to 04:00 PM		04:00 PM to 6:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper	Batch	Paper
03.05.2021	B1	I	B1	II	B1	III	B1	IV
04.05.2021	B1	V	B1	VI	B1	VII	B1	VIII
10.05.2021	B2	I	B2	II	B2	III	B2	IV
11.05.2021	B2	V	B2	VI	B2	VII	B2	VIII
12.05.2021	B3	I	B3	II	B3	III	B3	IV
13.05.2021	B3	V	B3	VI	B3	VII	B3	VIII
18.05.2021	B4	I	B4	II	B4	III	B4	IV
19.05.2021	B4	V	B4	VI	B4	VII	B4	VIII

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-I

### PAPER-III

(Plant Pathology)

Annual Examination, 2020

Time : 3 Hours.

Full Marks : 80

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

1. What is plant quarantine ? How it can help in disease control.
2. Discuss the role of Toxins in Pathogenesis.
3. What do you mean by biological control of plant disease ? Give an account of this method in control of soil borne pathogens.
4. Classify plant disease on different criteria.
5. Describe symptoms, etiology, disease cycle and control measures for Late blight of Potato.
6. Write short notes on any **Two** of the following :—
  - (a) Red Rot of Sugarcane
  - (b) White rust of Crucifers
  - (c) Little leaf of Brinjal
  - (d) Die back of Chilli
7. Describe symptoms, disease cycle, etiology and control measures of Stem rust of Wheat or Rust of Linseed.
8. Write short notes on any **Two** of the following :—
  - (a) Phytoalexins
  - (b) Epidemic disease
  - (c) Crop rotation
  - (d) Robert Koch and his postulates
9. Describe structural defense in host to resist plant pathogens.
10. Write pathological notes on any two of the following :—
  - (a) Mycoplasma
  - (b) Early blight of potato
  - (c) Covered smut of Wheat
  - (d) Wilt of Arhar

\* \* \*

### M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2020

Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Classes Programme

Enrollment No.	Batch	Date	Paper	Time
All Old students 190260001 to 190260054	<b>B1</b>	29.04.2021 & 30.04.2021	I to VIII	10:30 AM to 05:00 PM
190260055 to 190260123	<b>B2</b>	05.05.2021 & 06.05.2021	I to VIII	10:30 AM to 05:00 PM
190260124 to 190260184	<b>B3</b>	07.05.2021 & 08.05.2021	I to VIII	10:30 AM to 05:00 PM
190260185 to 190260278	<b>B4</b>	16.05.2021 & 17.05.2021	I to VIII	10:30 AM to 05:00 PM

#### Practical Examination Programme

Date	Time							
	09:30 AM to 11:30 AM		11:30 AM to 01:30 PM		02:00 PM to 04:00 PM		04:00 PM to 6:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper	Batch	Paper
03.05.2021	B1	I	B1	II	B1	III	B1	IV
04.05.2021	B1	V	B1	VI	B1	VII	B1	VIII
10.05.2021	B2	I	B2	II	B2	III	B2	IV
11.05.2021	B2	V	B2	VI	B2	VII	B2	VIII
12.05.2021	B3	I	B3	II	B3	III	B3	IV
13.05.2021	B3	V	B3	VI	B3	VII	B3	VIII
18.05.2021	B4	I	B4	II	B4	III	B4	IV
19.05.2021	B4	V	B4	VI	B4	VII	B4	VIII

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-I

### PAPER-IV

(Biology and diversity of Bryophyta and Pteridophyta)

Annual Examination, 2020

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'

- Classify Bryophytes up to order level. Mention important characters.
- Give an account of Progressive sterilization of sporogenous tissues in Bryophytes.
- Describe the characteristic feature of order Jungermaniales.
- Describe sporophyte of Marchantia and compare it with sporophyte of Anthoceros.
- Write short notes on any **Two** of the following :-
  - Similarities between Bryophytes and Algae
  - Role of Peristome in liberaion of spores
  - Capsule of Moss
  - Vegetative reproduction in Bryophytes

#### GROUP 'B'

- Describe the life cycle of *Psilotum* mention its affinities.
- Discuss the importance of heterospory in the origin and evolution of seed habit.
- What is Stele ? Describe different types of stele found in Pteridophytes. How siphonostele originates from Protostele.
- Write short notes on any **Two** of the following :-
  - Morphological nature of spike of *Ophioglossum*
  - Cone of *Equisetum*
  - Cone of *Calamites*
  - Types of sorus in ferns
- Describe the salient features of the life of a water fern.

\* \* \*

#### M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2020

Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Classes Programme

Enrollment No.	Batch	Date	Paper	Time
All Old students 190260001 to 190260054	<b>B1</b>	29.04.2021 & 30.04.2021	I to VIII	10:30 AM to 05:00 PM
190260055 to 190260123	<b>B2</b>	05.05.2021 & 06.05.2021	I to VIII	10:30 AM to 05:00 PM
190260124 to 190260184	<b>B3</b>	07.05.2021 & 08.05.2021	I to VIII	10:30 AM to 05:00 PM
190260185 to 190260278	<b>B4</b>	16.05.2021 & 17.05.2021	I to VIII	10:30 AM to 05:00 PM

#### Practical Examination Programme

Date	Time							
	09:30 AM to 11:30 AM		11:30 AM to 01:30 PM		02:00 PM to 04:00 PM		04:00 PM to 6:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper	Batch	Paper
03.05.2021	B1	I	B1	II	B1	III	B1	IV
04.05.2021	B1	V	B1	VI	B1	VII	B1	VIII
10.05.2021	B2	I	B2	II	B2	III	B2	IV
11.05.2021	B2	V	B2	VI	B2	VII	B2	VIII
12.05.2021	B3	I	B3	II	B3	III	B3	IV
13.05.2021	B3	V	B3	VI	B3	VII	B3	VIII
18.05.2021	B4	I	B4	II	B4	III	B4	IV
19.05.2021	B4	V	B4	VI	B4	VII	B4	VIII



# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-I

### PAPER-VI

(Management of Forest Resources)

Annual Examination, 2020

Time : 3 Hours.

Full Marks : 80

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

1. Discuss briefly importance of Agroforestry.
2. Describe causes for loss of forest resources.
3. What are the benefits of forests ? Explain.
4. What is cryopreservation ? Give examples of cryopreservation with its utility.
5. How Lac is obtained on commercial basis ? Mention its uses. ?
6. Describe Ecological pyramid of Forest Ecosystem ?
7. Explain different types of forest management.
8. Discuss the use of somatic embryogenesis.
9. Give an account of the classification of forest soil.
10. How gums, Resins and essential oil is procured from forest resource. Explain.

\* \* \*

### M.Sc. Botany, Part-I

#### Practical Examination Programme, 2020

Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna

Enrollment No.	Batch
All Old students & 190260001 to 190260054	<b>B1</b>
190260055 to 190260123	<b>B2</b>
190260124 to 190260184	<b>B3</b>
190260185 to 190260278	<b>B4</b>

#### Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:00 PM to 05:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
06.09.2021	B1	I	B1	II	B1	III
07.09.2021	B1	IV	B1	V	B1	VI
08.09.2021	B1	VII	B1	VIII	B2	I
09.09.2021	B2	II	B2	III	B2	IV
10.09.2021	B2	V	B2	VI	B2	VII
11.09.2021	B2	VIII	B3	I	B3	II
13.09.2021	B3	III	B3	IV	B3	V
14.09.2021	B3	VI	B3	VII	B3	VIII
15.09.2021	B4	I	B4	II	B4	III
16.09.2021	B4	IV	B4	V	B4	VI
18.09.2021	B4	VII	B4	VIII		

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-I**  
**PAPER-VII**  
 (Cell Biology)  
*Annual Examination, 2020*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. Describe structure and function of Peroxisome.
2. Describe how replication of DNA in angiosperm is Semi conservative ?
3. What is cell division ? Describe any two stages of miosis with suitable sketches.
4. Describe ultrastructure of Mitochondria mention its specific function.
5. Write short notes on any **Two** of the following :—
  - (a) Lamp brush chromosome
  - (b) Histone proteins
  - (c) Lysosome
  - (d) Apoptosis
6. Explain origin, structure and function of Golgi body.
7. Describe in detail structure of Nucleus. Name its different components.
8. Explain Nucleosome model for packaging of DNA into chromosome.
9. Explain Biochemical theory for origin of life.
10. Explain cell cycle. Also mention its significance.

\* \* \*

**M.Sc. Botany, Part-I**  
**Practical Examination Programme, 2020**  
**Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna**

Enrollment No.	Batch
All Old students & 190260001 to 190260054	<b>B1</b>
190260055 to 190260123	<b>B2</b>
190260124 to 190260184	<b>B3</b>
190260185 to 190260278	<b>B4</b>

**Practical Examination Programme**

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:00 PM to 05:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
06.09.2021	B1	I	B1	II	B1	III
07.09.2021	B1	IV	B1	V	B1	VI
08.09.2021	B1	VII	B1	VIII	B2	I
09.09.2021	B2	II	B2	III	B2	IV
10.09.2021	B2	V	B2	VI	B2	VII
11.09.2021	B2	VIII	B3	I	B3	II
13.09.2021	B3	III	B3	IV	B3	V
14.09.2021	B3	VI	B3	VII	B3	VIII
15.09.2021	B4	I	B4	II	B4	III
16.09.2021	B4	IV	B4	V	B4	VI
18.09.2021	B4	VII	B4	VIII		

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-I

### PAPER-VIII

(Plant Anatomy and Embryology)

Annual Examination, 2020

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 is abnormal secondary growth ? Describe abnormal secondary growth in Bignonia.
2. Give an account of Phellogen, Phelloderm and Phellem in context to secondary growth.
3. Describe various theories to explain the organization of Apical meristem.
4. Write short notes on any **Two** of the following :—
  - (a) Lenticels
  - (b) Types of Xylem.
  - (c) Types of Phloem.
  - (d) Lateral Meristem.
5. What is Mechanical tissue ? Explain its significance in plants.

#### GROUP 'B'

6. What are Endosperms ? Describe different types of Endosperms and mention their morphological nature.
7. Describe various steps followed for micropropagation of plants.
8. Describe double fertilization in Angiosperms.
9. What is a culture media ? Describe one culture media used in tissue culture. What are the major nutrients used.
10. Write short notes on any **Two** of the following :—
  - (a) Callus.
  - (b) Protoplast.
  - (c) Different barriers of fertilization.
  - (d) Growth regulators.

\* \* \*

**M.Sc. Botany, Part-I**  
**Practical Examination Programme, 2020**  
**Venue : Botany Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna**

Enrollment No.	Batch
All Old students & 190260001 to 190260054	<b>B1</b>
190260055 to 190260123	<b>B2</b>
190260124 to 190260184	<b>B3</b>
190260185 to 190260278	<b>B4</b>

#### Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:00 PM to 05:00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
06.09.2021	B1	I	B1	II	B1	III
07.09.2021	B1	IV	B1	V	B1	VI
08.09.2021	B1	VII	B1	VIII	B2	I
09.09.2021	B2	II	B2	III	B2	IV
10.09.2021	B2	V	B2	VI	B2	VII
11.09.2021	B2	VIII	B3	I	B3	II
13.09.2021	B3	III	B3	IV	B3	V
14.09.2021	B3	VI	B3	VII	B3	VIII
15.09.2021	B4	I	B4	II	B4	III
16.09.2021	B4	IV	B4	V	B4	VI
18.09.2021	B4	VII	B4	VIII		

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-II PAPER-IX

(Plant Physiology and Biochemistry)  
Annual Examination, 2020

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 is photophosphorylation ? Describe briefly Cyclic and Non-Cyclic Photophosphorylation.
2. Describe the mechanism of opening and closing Stomata.
3. What is Vernalization ? Describe its mechanism.
4. Write short notes on any **two** of the following :-
  - (a) Nastic movements
  - (b) Different types of growth hormones
  - (c) Cytokinin and its role
  - (d) Electron Transport System
5. Write briefly about Biochemical Nitrogen fixation.

### GROUP 'B'

6. What are Properties of enzymes ? Describe mechanism of action of enzymes.
7. Describe different types of Vitamins. How are they synthesized (any one)
8. Define biomolecules and justify that carbohydrates are biomolecules.

Or

What are Secondary metabolites ? Describe different roles played by these metabolites.

9. Write short notes on any **two** of the following :-
  - (a) Entropy
  - (b) Nitrification
  - (c) Transamination
  - (d) Chemical Structure of Chlorophyll
10. Write short notes on any **two** of the following :-
  - (a) Structure of DNA
  - (b) Structure of RNA
  - (c) Krebs's cycle
  - (d) EMP pathway

\* \* \*

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

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Time (Daily)
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

#### Practical Examination Programme

Date	Time					
	10.00 AM to 12.00 Noon		12.30 PM to 2.30 PM		3.00 PM to 5.00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	



# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-II

### PAPER–XI

(Molecular Biology)

Annual Examination, 2020

Time : 3 Hours.

Full Marks : 80

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

1. What are general properties of Genetic Code ? Explain wobble hypothesis.
2. Describe steps involved in the elongation of polypeptide during translation in Prokaryotes.
3. Describe different kinds of RNA and also mention their specific role.
4. Explain one gene one enzyme hypothesis. How it stands modified.
5. How DNA thread gets folded to form Nucleosome ? What is significance of Nucleosome in packaging of DNA.
6. Write short notes on any Four of the following :—
  - (a) Pseudo genes
  - (b) Chargaff's rule of DNA equivalence
  - (c) Spliceosome
  - (d) Exons and Introns
  - (e) Nitrogenous base
  - (f) Termination Codon
7. Write short notes on any two of the following :—
  - (a) Linker DNA
  - (b) Northern blotting
  - (c) Southern blotting
  - (d) Western blotting
8. What are transposons ? Why are they important in recombinant DNA research ?
9. Explain operon concept of gene regulation in Prokaryotes.
10. Differentiate between Polycistronic and Monocistronic gene.

\* \* \*

### M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Class Programme

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

#### Practical Examination Programme

<i>Date</i>	<i>Time</i>					
	<i>10.00 AM to 12.00 Noon</i>		<i>12.30 PM to 2.30 PM</i>		<i>3.00 PM to 5.00 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-II**  
**PAPER–XII**  
 (Environmental Biology)  
*Annual Examination, 2020*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. What do you understand by the term pollution ? Give an account of water pollution. Mention its remedy.
2. What do you understand by the term productivity in an ecosystem ? Describe various types of productivity of ecosystem.
3. What do you understand by the term sustainable development ? Discuss various strategies formulated for sustainable development.
4. What are the steps taken at Global level to Conserve biodiversity. Give an account.
5. What do you understand by the term biogeochemical cycle. Give an account of Phosphorus cycle.
6. Explain, how human activities have caused major threat to biodiversity. Explain in a systematic manner.
7. What is an Ecosystem ? Give an account of forest ecosystem.
8. Describe different vegetational belt of India.
9. Write short notes on any **Two** of the following :—  
 (a) Food web (b) Radioactive Pollution.  
 (c) Threatened categories of Plants (d) Endemism
10. Write short notes on any **Two** of the following :—  
 (a) Eutrophication  
 (b) Red data book and its significance  
 (c) World centre of Primary and Secondary diversity  
 (d) Hot Spots and their importance

\* \* \*

**M.Sc. Botany, Part–II**

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

**Practical Counselling Class Programme**

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

**Practical Examination Programme**

<i>Date</i>	<i>Time</i>					
	<b>10.00 AM to 12.00 Noon</b>		<b>12.30 PM to 2.30 PM</b>		<b>3.00 PM to 5.00 PM</b>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-II**  
**PAPER–XIII**  
(Plant Resources, Utilization and Conservation)  
*Annual Examination, 2020*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. Write significance of Biosphere Reserve or National Park. Enlist few of them found in India.
2. Write briefly the importance of *in-situ* and *ex-situ* conservation.
3. Describe reasons for depletion of Biodiversity. Describe measures to overcome this problem.
4. Describe steps involved in Tissue culture of Plants.
5. Describe methods adopted in fusion of protoplast. How somatic hybrids can be produced using the method ?
6. Write short notes on any **Two** of the following :—
  - (a) Fiber yielding plant
  - (b) Seed Bank
  - (c) Oil yielding plant
  - (d) Botanical of gardens in India
7. Describe the types of mangroves and its distribution in India.
8. Write short notes on any **Two** of the following :—
  - (a) DBT
  - (b) ICAR
  - (c) CSIR
9. What do you mean by the term Green Revolution. Describe strategies adopted in Green Revolution.
10. Write short notes on any **Two** of the following :—
  - (a) Wet lands of Bihar
  - (b) Manufacture of paper from pulp
  - (c) Five timber yielding plants
  - (d) Botanical survey of India and its importance

\* \* \*

**M.Sc. Botany, Part–II**

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

**Practical Counselling Class Programme**

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

**Practical Examination Programme**

<i>Date</i>	<b>Time</b>					
	<b>10.00 AM to 12.00 Noon</b>		<b>12.30 PM to 2.30 PM</b>		<b>3.00 PM to 5.00 PM</b>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-II**  
**PAPER–XIV**  
(Ethnobotany)  
*Annual Examination, 2020*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. Give a brief account of future strategy of Ethnobotany.
2. What do you mean by aromatic plants ? Write botanical name, family and importance of any five aromatic plants.
3. Write short notes on the following :—  
(a) CITES (b) IUCN  
(c) Seed gene Bank (d) Cryopreservation
4. Give a brief account of any four of the drug yielding plants. Also mention their use in Pharmaceutical industry.
5. Describe common spices and condiments found in India. Mention their importance.
6. What is germplasm ? How can it be conserved ?
7. Write short notes on any **Two** of the following :—  
(a) Sarpagandha (b) Ashwagandha  
(c) *Aloe vera* (d) Tulsi
8. Name some plants used by ethnic people for :—  
(a) Making of musical instruments  
(b) Making of agriculture implements  
(c) Plants used for religious purpose
9. Write an essay on centres of Ethnobotany in India.
10. Describe any five fibre yielding plants with botanical name and family.

\* \* \*

**M.Sc. Botany, Part–II**

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

**Practical Counselling Class Programme**

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

**Practical Examination Programme**

<i>Date</i>	<i>Time</i>					
	<i>10.00 AM to 12.00 Noon</i>		<i>12.30 PM to 2.30 PM</i>		<i>3.00 PM to 5.00 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	

**NALANDA OPEN UNIVERSITY**  
**M.Sc. Botany, Part-II**  
**PAPER–XV**  
 (Aerobiology)  
*Annual Examination, 2020*

**Time : 3 Hours.**

**Full Marks : 80**

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

1. What is allergy ? Describe various types of allergy and methods involved.
2. Describe post fertilization change leading to the formation of Ascospore in Fungi.
3. Describe aerobiology in relation to Plant Pathology.
4. Write an essay on aeromycoflora.
5. Write short notes on any **Two** of the following :—
  - (a) Various symptoms of Allergy
  - (b) Morphology of pollen
  - (c) Bacteria
  - (d) Nematodes
6. What do you mean by forecasting in aerobiology. How one can predict onset of disease on the basis of forecasting.
7. Write short notes on any **Two** of the following :—
  - (a) Air pollutants
  - (b) Immunity
  - (c) Soil pollutant
  - (d) Air Sampling methodologies
8. Explain the structure and morphology of fungal spores.
9. Explain sampling technique in detail.
10. Write the criteria for grouping organisms into five kingdoms. describe main characters of each kingdom with example.

\* \* \*

**M.Sc. Botany, Part–II**

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

**Practical Counselling Class Programme**

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

**Practical Examination Programme**

<i>Date</i>	<i>Time</i>					
	<i>10.00 AM to 12.00 Noon</i>		<i>12.30 PM to 2.30 PM</i>		<i>3.00 PM to 5.00 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	

# NALANDA OPEN UNIVERSITY

## M.Sc. Botany, Part-II

### PAPER–XVI

(Biotechnology and Bioinformatics)

Annual Examination, 2020

Time : 3 Hours.

Full Marks : 80

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

1. Describe the role of recombinant DNA in Agriculture.
2. What is Polymerase Chain Reaction (PCR) ? Describe its application.
3. What are T and B Lymphocytes ? Describe their role in immunity.
4. Describe the technique involved in production of Somatic hybrids.
5. Describe the role of vectors in recombinant DNA technology.
6. Give an account of DNA fingerprinting.
7. Give an account of role of cryopreservation in conservation of germ plasm.
8. Write short notes on any **Two** of the following :—
  - (a) DNA chips
  - (b) NCBI
  - (c) Byte
  - (d) *in situ* conservation
9. Fermentation is the base of modern Biotechnology, Discuss the statement.
10. Write briefly :—
  - (a) Protoplast isolation
  - (b) *Agrobacterium* plasmid

\* \* \*

### M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2020

Venue : 1<sup>st</sup> Floor, Biscomaun Tower, Patna

#### Practical Counselling Class Programme

<b>Enrollment No.</b>	<b>Batch</b>	<b>Date</b>	<b>Paper</b>	<b>Time (Daily)</b>
All Old Students & 180260001 to 180260035	<b>B1</b>	15.02.2021 & 17.02.2021	IX to XVI	10.00 AM to 4.30 PM
180260036 to 180260156	<b>B2</b>	22.02.2021 & 23.02.2021	IX to XVI	10.00 AM to 4.30 PM

#### Practical Examination Programme

<b>Date</b>	<b>Time</b>					
	<b>10.00 AM to 12.00 Noon</b>		<b>12.30 PM to 2.30 PM</b>		<b>3.00 PM to 5.00 PM</b>	
	<b>Batch</b>	<b>Paper</b>	<b>Batch</b>	<b>Paper</b>	<b>Batch</b>	<b>Paper</b>
18.02.2021	B1	IX	B1	X	B1	XI
19.02.2021	B1	XII	B1	XIII	B1	XIV
20.02.2021	B1	XV	B1	XVI	—	
24.02.2021	B2	IX	B2	X	B2	XI
25.02.2021	B2	XII	B2	XIII	B2	XIV
26.02.2021	B2	XV	B2	XVI	—	