

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-I
(Biodiversity of Plant and Diversity of Algae)
Annual Examination, 2023

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 the term Biodiversity ? Mention values of Biodiversity.
2. Write explanatory notes on any **Two** of the following:-
 - (a) IUCN
 - (b) Mutualism
 - (c) Productivity
 - (d) Different trophic level with example
3. What is Biogeochemical cycle ? Describe Nitrogen cycle in detail.
4. Describe with example threatened categories of plants and animals.
5. Write short notes on any **Two** of the following:-
 - (a) Natural resources
 - (b) Structure of an ecosystem
 - (c) Hot spot and its significance
 - (d) Food Chain

GROUP 'B'

6. Describe various mode of reproduction in Cyanophyceae.
7. Describe the economic importance of Algae.
8. Describe sexual reproduction in Phaeophyceae.
9. Describe characteristic feature of Rhodophyceae.
10. Write short notes on any **Four** of the following:-
 - (a) Globule and Nucule
 - (b) Cell of *Oedogonium*
 - (c) Role of Pyrenoids
 - (d) Akinete
 - (e) Symbiotic Algae
 - (f) Isomorphic alternation of generation

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EXAMINATION PROGRAMME-2023
M.Sc. Botany, Part-I

Date	Papers	Time	Examination Centre
31.05.2023	Paper-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
02.06.2023	Paper-II	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.06.2023	Paper-III	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
07.06.2023	Paper-IV	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
09.06.2023	Paper-V	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.06.2023	Paper-VI	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.06.2023	Paper-VII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.06.2023	Paper-VIII	10.30 AM to 1.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-II

(Microbiology and Diversity of Fungi)

Annual Examination, 2023

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 ultrastructure of TMV. How do they replicate in the Host Cell ?
2. What are various methods of genetic recombination in Bacteria ? Describe transformation in detail.
3. Describe Nutritional classification of Bacteria.
4. Write short notes on any **two** of the following:-
 - (a) Robert Koch
 - (b) Mycoplasma
 - (c) Contribution of Louis Pasteur
 - (d) Plasmid and its significance
5. Give an account of harmful role of microbes in nature.

GROUP 'B'

6. What is Heterothallism? Describe heterothallism in fungi.
7. Give an account of Para sexuality in Fungi. What is its significance.
8. Give an account of Mycotoxin. What is their significance in Human health.
9. Describe the life cycle of a fungus causing disease red rot of sugarcane.
10. Write short notes on any **two** of the following:-
 - (a) Development of Ascus
 - (b) Life cycle of Rust on Barberry
 - (c) Life cycle of Alternaria
 - (d) Cleistothecia

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-III
 (Plant Pathology)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Give an account of organic fungicides. What are qualities of good organic fungicides ?
2. Classify plant diseases on various criteria.
3. Discuss the role of Toxins in disease development.
4. What is plant quarantine ? How quarantine regulation can help in disease control.
5. Describe the role of Fungal Enzyme in disease development in plants.
6. What do you mean by biological control of plant disease ? How disease can be controlled by microbes ?
7. What do you understand by the term resistance for a disease in plants. Describe different kinds of disease resistance found in plants.
8. Describe structural defense in host to resist plant pathogens.
9. Describe symptoms, etiology and control of Citrus Canker.
10. Write short notes on any **Two** of the following :
 - (a) Bordeaux Mixture (b) Antibiotic
 - (c) Pre-disposing factor (d) Hypertrophy and Hyperplasia and disease symptom

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M.Sc. Botany, Part-I
Programme for Practical Counselling Classes and Annual Practical Examination, 2023
Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
All Old Students 220260001 to 220260018	B1	17.06.2023	I to IV	18.06.2023	V to VIII	9.00 AM to 6.30 PM
220260019 to 220260101	B2	23.06.2023	I to IV	24.06.2023	V to VIII	9.00 AM to 6.30 PM
220260102 to 220260188	B3	04.07.2023	I to IV	05.07.2023	V to VIII	9.00 AM to 6.30 PM
220260189 to 220260270	B4	11.07.2023	I to IV	12.07.2023	V to VIII	9.00 AM to 6.30 PM

Practical Examination Programme

<i>Date</i>	<i>Time</i>			
	<i>11.00 AM to 01.00 AM</i>		<i>02.30 PM to 05.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
21.06.2023	B1	V	B1	VI
22.06.2023	B1	VII	B1	VIII
27.06.2023	B2	I	B2	II
28.06.2023	B2	III	B2	IV
01.07.2023	B2	V	B2	VI
03.07.2023	B2	VII	B2	VIII
06.07.2023	B3	I	B3	II
07.07.2023	B3	III	B3	IV
08.07.2023	B3	V	B3	VI
10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I PAPER-IV

(Biology and diversity of Bryophyta and Pteridophyta)
Annual Examination, 2023

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 Progressive sterilization of sporogenous tissues in Bryophytes.
2. Describe the characteristics features of order Jungermaniales.
3. Describe sporophyte of *Anthoceros*. Mention its affinity.
4. Mention the salient feature of order Marchantiales.
5. Write short notes on any **Two** of the following:-
 - (a) Role of Peristome in liberation of spores
 - (b) Sporophyte of *Pellia*
 - (c) International structure of thallus of *Riccia* and *Anthoceros*
 - (d) Moss Protonema

GROUP 'B'

6. Describe the life cycle of any member of order Filicales.
7. Discuss the importance of heterospory in the origin and evolution of seed habit.
8. Describe stelar organization in Pteridophyte. How siphonostele evolves from protostele ?
9. Describe structure and reproduction in fossil member *Rhynia*. Mention its affinity.
10. Write short notes on any **Two** of the following:-
 - (a) Calamites and its fruiting body
 - (b) Sorus and its significance
 - (c) Types of sorus in ferns
 - (d) *Cyathea*

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Date	Paper	Time (Daily)
All Old Students 220260001 to 220260018	B1	17.06.2023	I to IV	18.06.2023	V to VIII	9.00 AM to 6.30 PM
220260019 to 220260101	B2	23.06.2023	I to IV	24.06.2023	V to VIII	9.00 AM to 6.30 PM
220260102 to 220260188	B3	04.07.2023	I to IV	05.07.2023	V to VIII	9.00 AM to 6.30 PM
220260189 to 220260270	B4	11.07.2023	I to IV	12.07.2023	V to VIII	9.00 AM to 6.30 PM

Practical Examination Programme

Date	Time			
	11.00 AM to 02.00 PM		02.30 PM to 05.30 PM	
	Batch	Paper	Batch	Paper
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
21.06.2023	B1	V	B1	VI
22.06.2023	B1	VII	B1	VIII
27.06.2023	B2	I	B2	II
28.06.2023	B2	III	B2	IV
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10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-V
(Diversity of Seed plants and their taxonomy)
Annual Examination, 2023

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 Female gametophyte of *Pinus*.
2. Classify Gymnosperms upto the level of classes.
3. Give an account of reproductive organs of fossil member *Williamsonia*.
4. Describe critically affinity of Gymnosperms with Pteridophytes.
5. Write short notes on any **Two** of the following :-
 - (a) Method of Fossilization
 - (b) Geological time scale
 - (c) Ovule of Lyginopteris
 - (d) Ovule of Bennettites

GROUP 'B'

6. Describe briefly Hutchinson system of classification of Angiosperms.
7. Prepare a list of eight Medicinal/Oil yielding/wood yielding plants giving their botanical names and family.
8. Describe the floral characters of family Labiatae.
9. What are secondary metabolites of Plant origin ? Mention their significance.
10. Write short notes on any **Two** of the following :-
 - (a) ICBN
 - (b) Cytotaxonomy
 - (c) Natural system of Classification
 - (d) Chemotaxonomy

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M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
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220260189 to 220260270	B4	11.07.2023	I to IV	12.07.2023	V to VIII	9.00 AM to 6.30 PM

Practical Examination Programme

<i>Date</i>	<i>Time</i>			
	11.00 AM to 02.00 PM		02.30 PM to 05.30 PM	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
21.06.2023	B1	V	B1	VI
22.06.2023	B1	VII	B1	VIII
27.06.2023	B2	I	B2	II
28.06.2023	B2	III	B2	IV
01.07.2023	B2	V	B2	VI
03.07.2023	B2	VII	B2	VIII
06.07.2023	B3	I	B3	II
07.07.2023	B3	III	B3	IV
08.07.2023	B3	V	B3	VI
10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-VI

(Management of Forest Resources)

Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is MAB ? Describe its project related to forest.
2. What is Pulp and Paper ? Describe the process of making of paper.
3. Describe the drugs and spices obtained from the forest.
4. Describe the main objectives of improvement of trees.
5. Describe causes for loss of forest resources.
6. How Lac is obtained on commercial basis ? Mention its uses ?
7. What is cryopreservation ? Give examples of cryopreservation with its utility.
8. Describe ecological pyramid of Forest Ecosystem ?
9. Give an account of the classification of forest soil.
10. Write notes on any **Two** of the following:-
 - (a) Application of haploidy
 - (b) Social forestry
 - (c) Protoplast culture and fusion
 - (d) Shifting cultivation

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Date	Paper	Time (Daily)
All Old Students 220260001 to 220260018	B1	17.06.2023	I to IV	18.06.2023	V to VIII	9.00 AM to 6.30 PM
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Practical Examination Programme

Date	Time			
	11.00 AM to 02.00 PM		02.30 PM to 05.30 PM	
	Batch	Paper	Batch	Paper
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
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10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-VII
 (Cell Biology)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What are carcinogens ? Describe the causes of cancer.
2. Describe fluid mosaic model to explain ultra-structure of biological membrane. Why this model is universally accepted ?
3. Describe the ultra structure of Chloroplast. Briefly explain its function.
4. Describe how replication of DNA in angiosperm is Semi conservative.
5. Describe in detail structure of Nucleus. Name its different components.
6. Give an account of origin of life and its experimental proof.
7. Describe in detail different stages of prophase of meiosis. Describe significance of the phase.
8. Describe different types RNA, mention specific role of each.
9. Describe Nucleosome model to explain the structure of Eukaryotic Chromosome.
10. Write short notes on any **Four** of the following :

(a) Endoplasmic reticulum	(b) Lysosome
(c) Golgi body	(d) Histone proteins
(e) Apoptosis	(f) Z-DNA

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M.Sc. Botany, Part-I
Programme for Practical Counselling Classes and Annual Practical Examination, 2023
Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

<i>Enrollment No.</i>	<i>Batch</i>	<i>Date</i>	<i>Paper</i>	<i>Date</i>	<i>Paper</i>	<i>Time (Daily)</i>
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220260189 to 220260270	B4	11.07.2023	I to IV	12.07.2023	V to VIII	9.00 AM to 6.30 PM

Practical Examination Programme

<i>Date</i>	<i>Time</i>			
	<i>11.00 AM to 02.00 PM</i>		<i>02.30 PM to 05.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
21.06.2023	B1	V	B1	VI
22.06.2023	B1	VII	B1	VIII
27.06.2023	B2	I	B2	II
28.06.2023	B2	III	B2	IV
01.07.2023	B2	V	B2	VI
03.07.2023	B2	VII	B2	VIII
06.07.2023	B3	I	B3	II
07.07.2023	B3	III	B3	IV
08.07.2023	B3	V	B3	VI
10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-VIII

(Plant Anatomy and Embryology)

Annual Examination, 2023

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 role of Phellogen in healing of wound.
3. What is Mechanical tissue ? Explain its significance in plants.
4. Give an account of different types of vascular bundles found in angiosperm plant.
5. Classify stomata into its various types with suitable diagram, mentioning the significance of each type.

GROUP 'B'

6. Give an account of morphological nature of Endosperm.
7. Describe causes of Polyembryony. What is its application.
8. Describe various steps followed for micropropagation of plants.
9. Describe in detail uses of Experimental embryology.
10. Write short notes on any **Two** of the following:
 - (a) calius
 - (b) Different barriers of fertilization
 - (c) Protoplast
 - (d) Growth Regulators

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Date	Paper	Time (Daily)
All Old Students 220260001 to 220260018	B1	17.06.2023	I to IV	18.06.2023	V to VIII	9.00 AM to 6.30 PM
220260019 to 220260101	B2	23.06.2023	I to IV	24.06.2023	V to VIII	9.00 AM to 6.30 PM
220260102 to 220260188	B3	04.07.2023	I to IV	05.07.2023	V to VIII	9.00 AM to 6.30 PM
220260189 to 220260270	B4	11.07.2023	I to IV	12.07.2023	V to VIII	9.00 AM to 6.30 PM

Practical Examination Programme

Date	Time			
	11.00 AM to 02.00 PM		02.30 PM to 05.30 PM	
	Batch	Paper	Batch	Paper
19.06.2023	B1	I	B1	II
20.06.2023	B1	III	B1	IV
21.06.2023	B1	V	B1	VI
22.06.2023	B1	VII	B1	VIII
27.06.2023	B2	I	B2	II
28.06.2023	B2	III	B2	IV
01.07.2023	B2	V	B2	VI
03.07.2023	B2	VII	B2	VIII
06.07.2023	B3	I	B3	II
07.07.2023	B3	III	B3	IV
08.07.2023	B3	V	B3	VI
10.07.2023	B3	VII	B3	VIII
13.07.2023	B4	I	B4	II
14.07.2023	B4	III	B4	IV
15.07.2023	B4	V	B4	VI
17.07.2023	B4	VII	B4	VIII

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-II

PAPER-IX

(Plant Physiology and Biochemistry)

Annual Examination, 2023

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 C₄ cycle for fixation of carbon dioxide in plants.
2. Define stress. Give a brief account of water and salt stress.
3. What is Photophosphorylation? Give an account of non-cyclic and cyclic photophosphorylations.
4. What are Phytohormones? Describe the mode of action and role of Gibberellins.
5. Write short notes on any **two** of the following:-
 - (a) Nastic movements
 - (b) Geotropism
 - (c) Florigen and its role
 - (d) Vernalization

GROUP 'B'

6. What are secondary metabolites? Describe different roles played by these metabolites.
7. Describe the pathway of formation of Pyruvic acid from Glucose.
8. Comment on nitrogen fixing bacteria. Give a brief account of symbiotic Nitrogen fixation.
9. Describe properties and mechanism of action of Enzymes.
10. Write short notes on any **two** of the following :-
 - (a) Nitrification
 - (b) Kreb's cycle
 - (c) Exothermic and Endothermic reactions
 - (d) Structure of RNA

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EXAMINATION PROGRAMME-2023

M.Sc. Botany, Part-II

Date	Papers	Time	Examination Centre
29.09.2023	Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
03.10.2023	Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
05.10.2023	Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
07.10.2023	Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
10.10.2023	Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
13.10.2023	Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
16.10.2023	Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
18.10.2023	Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

M.Sc. Botany, Part-II

Programme for Practical Counselling Classes and Practical Examination, 2021

Venue : 1st Floor, Biscomaun Tower, Patna

(A) Practical Counselling Classes Programme

<i>Enrollment No.</i>	<i>Batch</i>	<i>09.30 AM to 05.30 PM</i>			
		<i>Date</i>	<i>Paper</i>	<i>Date</i>	<i>Paper</i>
All Old Students & 190260001 to 190260045	B1	11-08-2022	IX - XII	13-08-2022	XIII - XVI
190260046 to 190260140	B2	20-08-2022	IX - XII	22-08-2022	XIII - XVI
190260141 to 190260300	B3	26-08-2022	IX - XII	27-08-2022	XIII - XVI

(B) Practical Examination Programme

<i>Date</i>	<i>Batch</i>	<i>08 AM to 11 AM</i>	<i>11 AM to 02 PM</i>	<i>02.30 PM to 05.30 PM</i>
16-08-2022	B1	IX	X	XI
17-08-2022	B1	XII	XIII	XIV
18-08-2022	B1	XV	XVI	----
23-08-2022	B2	IX	X	XI
24-08-2022	B2	XII	XIII	XIV
25-08-2022	B2	XV	XVI	----
29-08-2022	B3	IX	X	XI
30-08-2022	B3	XII	XIII	XIV
31-08-2022	B3	XV	XVI	----

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-X
(Cytogenetics and Crop Improvement)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe different tools used in Genetic Engineering. Briefly mention their significance.
2. How is Lac-Operon regulated?
3. Describe molecular mechanism of gene mutation.
4. Give an account of DNA finger printing and its uses.
5. Write short notes on any **two** of the following :
(a) Linkage (b) Back cross and test cross
(c) Nucleosome (d) Translocation
6. Describe crossing over. Mention its mechanism and significance.
7. Give an account of sex determination in plants.
8. Write short notes on any two of the following :-
(a) Trisomy (b) Triticale
(c) Plasmid as vector (d) Colourblindness
9. Write in brief the steps of tissue culture with special reference to wheat or rice.
10. What is epistasis in gene interaction? Describe its types and examples.

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M.Sc. Botany, Part-II

Programme for Practical Counselling Classes and Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-II

PAPER–XI

(Molecular Biology)

Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Explain regulation of Lac-operon.
2. What is transformation? Describe process of transformation in prokaryotes.
3. How Meselson and Stahl proved that DNA replication is semi-conservative?
4. Write short notes on:
 - (a) DNA repair
 - (b) Jumping genes
5. What are different kinds of RNA and their roles?
6. Explain one gene one enzyme.
7. Write **short** notes on:
 - (a) Splicing (Processing of H_n RNA)
 - (b) Initiation factor in eukaryotes
8. Write Watson and Crick model of DNA. Comment upon Z-DNA.
9. Describe initiation of protein synthesis in prokaryotes.
10. Write **short** notes on:
 - (a) Overlapping gene
 - (b) Reverse transcriptase

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XII
 (Environmental Biology)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Give an account of abiotic and biotic components of an ecosystem.
2. Define productivity and describe various types of productivity in an ecosystem.
3. Write an essay on air pollution and suggest control to minimize it.
4. Write short notes on:-
 (a) Food chain and food web
 (b) Energy flow concept of ecosystem
5. Define population. Give a concise account of various characteristics of population of organisms.
6. Write short notes on:-
 (a) Global warming (b) Endemism
7. Explain how human activity is the major threat to biodiversity?
8. Write short notes on the following :
 (a) Xerosere (b) Threatened categories of plants
9. Acquaint with natural disasters and write how to mitigate their hazards.
10. Discuss positive interaction among populations of the world.

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023
 Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XIII
(Plant Resources, Utilization and Conservation)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe the method of protoplast isolation and its culture.
2. Give botanical name, family, active ingredients and uses of 5 medicinal plants.
3. Name five oil yielding plants with its botanical name, family and uses.
4. What are the principles and strategy of in situ conservation?
5. Describe the reasons for depletion of biodiversity. Write few steps to overcome this problem.
6. Write short notes on any **two** of the following:
 - (a) DBT
 - (b) Sanctuaries with their importance
 - (c) Botanical gardens in India
7. What do you mean by cereals? Discuss their importance in relation to human health.
8. Write short notes on any **two** of the following:
 - (a) Tea (b) NBPGR (c) National Park
9. What are fibres? Describe different types of fibre of commercial use.
10. Write short notes on the following:
 - (a) Four timber yielding plants
 - (b) Plant products used in poultry feeds
 - (c) Mangroves types
 - (d) Biosphere reserves

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023
Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	09.00 AM to 11.00 AM		11.00 AM to 1.00 PM		1.30 PM to 3.30 PM		3.30 PM to 5.30 PM	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XIV
 (Ethnobotany)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is Ethnobotany? Describe in detail the scope and its objectives.
2. Highlight the importance of indigenous medicinal plants. How can it help in deciding future strategy?
3. What are scientific principles adopted for identification of a plant? What is its importance?
4. Write short notes on any two of the following:-
 - (a) Cryopreservation
 - (b) Alkaloids
 - (c) Aromatic plants
 - (c) Documentation of medicinal plants
5. Describe different methods of storage of herbal drugs.
6. Mention the ex-situ conservation strategies.
7. What are Vitamins? Describe the sources of different vitamins.
8. Write short notes on.
 - (a) Endangered and endemic taxa
 - (b) Ethnobotany of religious plants.
9. Name the original homeland of some important crops. Mention Vavilov's contribution in origin and cultivation of plants.
10. Write short notes on:-
 - (a) Sources of plant protein
 - (b) Export potential of medicinal plants in India.

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023
 Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XV
(Aerobiology)
Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe role of pollen grains in causing allergy reactions.
2. Explain aerobiology in relation to plant pathology.
3. Describe sampling principles for collection of microorganisms.
4. Give an account of post fertilization changes leading to formation of Ascospores.
5. Write short notes on:
 - (a) Structure of different types of pollen grains.
 - (b) Asexual spores of fungi
6. Give an account of source of allergy and its various response.
7. Describe the current state and future challenges of aerobiological studies.
8. Write short notes on any **two** of the following:
 - (a) Allergens
 - (b) Food allergy
 - (c) Immunity
 - (d) Air borne allergy diseases.
9. How prokaryotic cells differ from eukaryotes? Explain with sketches.
10. Write short notes on:
 - (a) Clinical and environmental microbiology
 - (b) Scope of aerobiology

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-II

PAPER–XVI

(Biotechnology and Bioinformatics)

Annual Examination, 2023

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What are Restriction enzymes? Discuss their types and uses.
2. Give an account of role of cryopreservation in conservation of germplasm.
3. Describe the technique involved in production of somatic hybrids.
4. Write short notes on any **two** of the following:
 - (a) Cell mediated and humoral immunity
 - (b) Artificial seed
 - (c) Genetic counselling
 - (d) Protoplast isolation
5. Describe the role of recombinant DNA technology in Agriculture.
6. Give an account of various methods of sterilization? Which method is considered to be most effective?
7. Write **short** notes on:
 - (a) Proteomics
 - (b) Central Processing Unit (CPU)
 - (c) Blast
 - (d) NCBI
8. Describe the technique of Southern blotting.
9. What are secondary metabolites? Describe how and when secondary metabolites are produced by plant?
10. Write **short** notes on:
 - (a) Anther culture protocol
 - (b) Somatic embryogenesis

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2023

Venue : Botany Lab, 1st Floor, Biscomaun Tower, Patna

(A) Details of Batches

<i>Enrollment No.</i>	<i>Batch</i>
All old Students	B1
210260001 – 210260126	B2
210260127 – 210260310	B3

(B) Practical Counselling Class Programme

<i>Date</i>	<i>Batch</i>	<i>Time (Daily)</i>	<i>Paper</i>
19.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	IX to XII
20.10.2023	For all Batches (B1,B2,B3)	09.00 AM to 5.30 PM	XIII to XVI

(C) Practical Examination Programme

<i>Date</i>	<i>Time</i>							
	<i>09.00 AM to 11.00 AM</i>		<i>11.00 AM to 1.00 PM</i>		<i>1.30 PM to 3.30 PM</i>		<i>3.30 PM to 5.30 PM</i>	
	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>	<i>Batch</i>	<i>Paper</i>
26.10.2023	B1	IX	B1	X	B2	IX	B2	X
27.10.2023	B1	XI	B1	XII	B2	XI	B2	XII
28.10.2023	B1	XIII	B1	XIV	B2	XIII	B2	XIV
30.10.2023	B1	XV	B1	XVI	B2	XV	B2	XVI
31.10.2023	B3	IX	B3	X	B3	XI	×	×
01.11.2023	B3	XII	B3	XIII	B3	XIV	×	×
02.11.2023	B3	XV	B3	XVI	×	×	×	×