

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-I
(Biodiversity of Plant and Diversity of Algae)
Annual Examination, 2021

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 are different types of Biodiversity? Describe each one of them in detail.
2. What are different values of Biodiversity? How these values can be increased.
3. Describe important Biodiversity zones of India.
4. What is Biogeochemical cycle? Describe Nitrogen cycle in detail.
5. Describe with example threatened categories of plants and animals.

GROUP 'B'

6. Describe range of vegetative structure in Chlorophyceae.
7. Describe characteristic feature of Rhodophyceae.
8. What is Isomorphic alternation of generation? Describe with reference to life cycle of *Ectocarpus*.
9. Describe ultrastructure of a Cyanophycean cell.
10. Write Short notes on any **Four** of the following:-
 - (a) Globule and Nucule (b) Cap cells of *Oedogonium*
 - (c) Heterocyst of Blue Algae (d) Economic importance of Red algae and Brown algae
 - (e) Sexual reproduction in Phaeophyceae (f) Chanstransia stage

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REVISED EXAMINATION PROGRAMME-2021
M.Sc. Botany, Part-I

Date	Papers	Time	Examination Centre
17.06.2022	Paper-I	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
18.06.2022	Paper-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
20.06.2022	Paper-III	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.06.2022	Paper-IV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.06.2022	Paper-V	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
25.06.2022	Paper-VI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
27.06.2022	Paper-VII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
28.06.2022	Paper-VIII	2.30 PM to 5.30 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, 2021

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 ultra-structure of TMV. How do they replicate in the host cell?
2. Write an essay on Industrial importance of Bacteria.
3. What is Genetic recombination in Bacteria? Describe Transduction in detail.
4. Write short notes on any **two** of the following:-
 - (a) Mesosome
 - (b) Contribution of Alexander Fleming in Microbiology
 - (c) Types of Plasmids and its role
 - (d) Bacterial Nutrition
5. Describe the structure of Mycoplasma. What are their types and name the disease it causes?

GROUP 'B'

6. Describe the role of Fungi in Industries.
7. Describe Heterothallism and its importance in the life cycle of Fungi.
8. Describe life cycle of Fungus causing Late blight of Potato. How this fungus reoccurs on the plains of India every year.
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) Cultivation of Mushroom
 - (c) Life cycle of Rust on Barberry
 - (d) Life cycle of Alternaria

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REVISED EXAMINATION PROGRAMME-2021

M.Sc. Botany, Part-I

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17.06.2022	Paper-I	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
18.06.2022	Paper-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
20.06.2022	Paper-III	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
21.06.2022	Paper-IV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
23.06.2022	Paper-V	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
25.06.2022	Paper-VI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
27.06.2022	Paper-VII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
28.06.2022	Paper-VIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-III

(Plant Pathology)

Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

- Write briefly the method of chemical defense in plants to restrict disease development.
- Discuss the role of Toxins in disease development.
- Give a brief account of systemic fungicides.
- What is disease forecasting? Explain how it helps in controlling plant disease.
- Describe various types of disease symptoms caused in host plant due to fungal infection.
- What do you mean by biological control of plant disease? How disease can be controlled by microbes?
- Describe symptoms, etiology disease cycle and control of Tobacco Mosaic Virus of Citrus Canker.
- Write short notes on any **Two** of the following :—
 - Burgandy mixture
 - Soil amendment
 - Little leaf of Brinjal
 - Wilt of Arhar
- Describe symptoms, etiology and control of loose smut of wheat
- Describe the role of Fungal Enzymes in disease development in plants.

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M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) Arrangement of Batches

Enrollment No.	Batch
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

(B) Practical Counselling Classes Programme

Date	Batch	Time	Paper
29.06.2022	B1	09.00 AM to 05.00 PM	I to IV
30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
12.07.2022	B3	09.00 AM to 05.00 PM	I to IV
13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:30 PM to 05:30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
02.07.2022	B1	IV	B1	V	B1	VI
04.07.2022	B1	VII	B1	VIII	xxx	xxx
07.07.2022	B2	I	B2	II	B3	III
08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-IV

(Biology and diversity of Bryophyta and Pteridophyta)

Annual Examination, 2021

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'

- Describe sporophyte of *Anthoceros*. Mention its affinity.
- Mention the salient feature of order Marchantiales.
- Write short notes on any **Two** of the following:-
 - Moss protonema
 - Sporophyte of *Marchantia*
 - Internal Structure of thallus of *Marchantia*.
 - Economic importance of Bryophytes.
- Give an account of sporophyte of *Sphagnum*. How it differs from Sporophyte of *Marchantia*.
- Give an account of vegetative reproduction in Bryophytes.

GROUP 'B'

- Describe stelar organization in Pteridophyte. How siphonostele evolves from protostele.?
- Describe structure and reproduction in fossil member *Rhynia*. Mention its affinity.
- Describe sporophyte of *Selaginella*. What light does it throw on origin of seed habit.
- Stem of *Lycopodium* shows different types of vascular cylinder, describe each one with example.
- Write short notes on any **Two** of the following:-
 - Spike of *ophiglossum*
 - Sorus and its significance
 - Calamites and its fruiting body
 - Graphic life cycle of *Psilotum*

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M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) Arrangement of Batches

Enrollment No.	Batch
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

(B) Practical Counselling Classes Programme

Date	Batch	Time	Paper
29.06.2022	B1	09.00 AM to 05.00 PM	I to IV
30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
12.07.2022	B3	09.00 AM to 05.00 PM	I to IV
13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:30 PM to 05:30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
02.07.2022	B1	IV	B1	V	B1	VI
04.07.2022	B1	VII	B1	VIII	xxx	xxx
07.07.2022	B2	I	B2	II	B3	III
08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-V
(Diversity of Seed plants and their taxonomy)
Annual Examination, 2021

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 reproductive organs of fossil member *Williamsonia*.
2. Describe development of Male gametophyte of Pinus.
3. Give an account of Female gametophyte of *Taxus*.
4. Describe critically affinity of Gymnosperms with Pteridophytes.
5. Write short notes on any **Two** of the following :-
(a) Methods of Fossilization (b) Geological time scale
(c) Medicinal use of Gymnosperms (d) Ovule of Lyginopteris

GROUP 'B'

6. Describe briefly Hutchinson system of classification of Angiosperm.
7. Write short notes on any **two** of the following:-
(a) Placentation (b) Binomial nomenclature
(c) Types of special types of inflorescences (d) Chemotaxonomy
8. Prepare a list of eight Medicinal/Oil yielding/Wood yielding plants giving their botanical names and family.
9. Describe in detail family Labiatae or Acanthaceae.
10. Mention phylogeny of family magnoliaceae.

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) *Arrangement of Batches* (B) *Practical*
Counselling Classes Programme

<i>Enrollment No.</i>	<i>Batch</i>
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

Date	Batch	Time	Paper
29.06.2022	B1	09.00 AM to 05.00 PM	I to IV
30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
12.07.2022	B3	09.00 AM to 05.00 PM	I to IV
13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:30 PM to 05:30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
02.07.2022	B1	IV	B1	V	B1	VI
04.07.2022	B1	VII	B1	VIII	xxx	xxx
07.07.2022	B2	I	B2	II	B2	III
08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-VI

(Management of Forest Resources)

Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Give an account of Forest resources.
2. Give an account of Drugs and spices obtained from Forest.
3. Explain the role of Agroforestry in India.
4. How social forestry helps in increasing Forest wealth.
5. Discuss importance of tissue culture in Forestry.
6. Describe different methods of plantation in India.
7. Give an account of Forest Ecosystem. Mention its important component.
8. What methods can be adopted to conserve forest wealth.
9. Write notes on any **two** of the following:-
 - (a) MAB programme
 - (b) Shifting cultivation
 - (c) Afforestation programme
 - (d) Mangrove vegetation
10. How to obtain disease free plant through tissue culture.

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) Arrangement of Batches

(B) Practical

Enrollment No.	Batch
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

Date	Batch	Time	Paper
29.06.2022	B1	09.00 AM to 05.00 PM	I to IV
30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
12.07.2022	B3	09.00 AM to 05.00 PM	I to IV
13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

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	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
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04.07.2022	B1	VII	B1	VIII	xxx	xxx
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08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-I
PAPER-VII
 (Cell Biology)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Give an account of ultrastructure of Mitochondria or Chloroplast mention its specific function.
2. What is cell cycle? Mention importance of each phase of cell cycle.
3. Describe the structure and function of peroxisome. Mention its function.
4. Describe in detail different stages of prophase of meiosis. Describe significance of the phase.
5. Give an account of origin of life and its experimental proof.
6. Describe different types RNA, mention specific role of each.
7. Describe Nucleosome model to explain the structure of Eukaryotic Chromosome.
8. Explain Fluid Mosaic model to describe the structure of Plasma membrane.
9. Write short notes on any **Four** of the following :
 - (a) Endoplasmic reticulum
 - (b) Lysosome
 - (c) Golgi body
 - (d) Scanning electron Microscope
 - (e) Satellite Chromosome
 - (f) Chemical structure of DNA
10. Describe various steps involved in preparing a cytological slide for study of Chromosome in a eukaryotic cell.

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) Arrangement of Batches

(B) Practical

Counselling Classes Programme

Enrollment No.	Batch
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

Date	Batch	Time	Paper
29.06.2022	B1	09.00 AM to 05.00 PM	I to IV
30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
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13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:30 PM to 05:30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
02.07.2022	B1	IV	B1	V	B1	VI
04.07.2022	B1	VII	B1	VIII	xxx	xxx
07.07.2022	B2	I	B2	II	B2	III
08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-I

PAPER-VIII

(Plant Anatomy and Embryology)

Annual Examination, 2021

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 vascular bundles found in angiosperm plant.
2. Describe apical meristem in a Dicot plant.
3. Write explanatory notes on any **Four** of the following:

(a) Cork cambium	(b) Abscission layer and leaf fall
(c) Periderm	(d) Secondary growth in Monocot stem
(e) Guard cells and its role	
4. Give an example to show abnormal secondary growth in Dicot plant.

GROUP 'B'

5. Describe different barriers of fertilization.
6. Describe protocol for tissue culture of plant part.
7. Give an account of experimental embryology.
8. Describe development of embryo sac in angiosperm.
9. Give an account of morphological nature of Endosperm.
10. Describe the development of Female gametophyte in Angiosperm.

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Revised

M.Sc. Botany, Part-I

Programme for Practical Counselling Classes and Annual Practical Examination, 2021

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

(A) Arrangement of Batches

(B) Practical

Counselling Classes Programme

Enrollment No.	Batch
All Old Students and 200260001 to 200260023	B1
200260024 to 200260099	B2
200260100 to 200260626	B3
200260627 to 200261200	B4

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30.06.2022	B1	09.00 AM to 05.00 PM	V to VIII
05.07.2022	B2	09.00 AM to 05.00 PM	I to IV
06.07.2022	B2	09.00 AM to 05.00 PM	V to VIII
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13.07.2022	B3	09.00 AM to 05.00 PM	V to VIII
17.07.2022	B4	09.00 AM to 05.00 PM	I to IV
18.07.2022	B4	09.00 AM to 05.00 PM	V to VIII

(C) Practical Examination Programme

Date	Time					
	08:00 AM to 11:00 AM		11:00 AM to 02:00 PM		02:30 PM to 05:30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper
01.07.2022	B1	I	B1	II	B1	III
02.07.2022	B1	IV	B1	V	B1	VI
04.07.2022	B1	VII	B1	VIII	xxx	xxx
07.07.2022	B2	I	B2	II	B2	III
08.07.2022	B2	IV	B2	V	B2	VI
09.07.2022	B2	VII	B2	VIII	xxx	xxx
14.07.2022	B3	I	B3	II	B3	III
15.07.2022	B3	IV	B3	V	B3	VI
16.07.2022	B3	VII	B3	VIII	xxx	xxx
19.07.2022	B4	I	B4	II	B4	III
20.07.2022	B4	IV	B4	V	B4	VI
21.07.2022	B4	VII	B4	VIII	xxx	xxx

NALANDA OPEN UNIVERSITY

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

(Plant Physiology and Biochemistry)
Annual Examination, 2021

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'

- Describe the Mechanism of Opening and Closing of Stomata.
- Give an account of Calvin cycle. Give few points to explain difference between C3 and C4 plants.
- Give an account of the induced movements in plants.
- What is Stress ? Give a brief account of salt stress in plants.
- Write short notes on any **two** of the following :-
(a) Nastic movements (b) Phototaxis (c) Geotropism and Auxins

GROUP 'B'

- What are Enzymes ? Describe properties and mechanism of action of Enzymes.
- Describe biochemical nitrogen fixation.
- What is Electron Transport System ? How and where they operate.
- Describe various steps involved in formation of Pyruvic acid from Glucose.
- Write short notes on any **two** of the following :-
(a) Carbon cycle (b) Nitrification
(c) Role of chlorophyll in Photosynthesis (d) Exothermic and Endothermic reactions

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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

Enrollment No.	Batch	09.30 AM to 05.30 PM			
		Date	Paper	Date	Paper
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

Date	Batch	08 AM to 11 AM	11 AM to 02 PM	02.30 PM to 05.30 PM
16-08-2022	B1	IX	X	XI
17-08-2022	B1	XII	XIII	XIV
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25-08-2022	B2	XV	XVI	----
29-08-2022	B3	IX	X	XI
30-08-2022	B3	XII	XIII	XIV
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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-X

(Cytogenetics and Crop Improvement)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. How Mendelian ratio stands modified. Give one example to explain.
2. What is Polyploidy? Describe its origin, types and significance.
3. Give an account of the structure and significance of supernumerary chromosomes.
4. Write short notes on any Two of the following:-
 - (a) Plasmid as vector
 - (b) Bacteriophage as vector
 - (c) Enzyme Ligase
 - (d) Restriction Endonuclease.
5. Write short notes on any **two** of the following :
 - (a) Karyotype analysis
 - (b) Polytene Chromosome
 - (c) Ideogram
 - (d) Nucleosome
6. Describe different tools used in Genetic Engineering. Briefly mention their significance.
7. Explain regulation of genes in Prokaryote (Lactose Operon).
8. Give an account of DNA fingerprinting. When this technique is used.
9. Write short notes on:-
 - (a) PCR technology to amplify DNA
 - (b) Codominance
10. Describe Molecular mechanism of Mutation.

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M.Sc. Botany, Part-II

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 Venue : 1st Floor, Biscomaun Tower, Patna

(A) Practical Counselling Classes Programme

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190260141 to 190260300	B3	26-08-2022	IX - XII	27-08-2022	XIII - XVI

(B) Practical Examination Programme

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XI

(Molecular Biology)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is Genetic Code ? Describe essential properties of Genetic Code.
2. What are different types of RNA in Prokaryotes and Eukaryotes ?
3. How Meselson and Stahl prove that replication of DNA is semi-conservative ?
4. Write short notes on :—
 (a) Significance of DNA repair (b) Wobble hypothesis
5. Explain one gene one enzyme hypothesis.
6. Describe briefly steps in initiation of protein synthesis in prokaryotes.
7. Write short notes on :—
 (a) Initiation factor in eukaryotes. (b) Splicing (processing of Hn RNA)
8. Write short notes on :—
 (a) Exon
 (b) Activation of amino acids during protein synthesis.
9. What is Transformation ? Describe process of Transformation in Prokaryotes.
10. Differentiate between polycistronic and monocistronic genes.

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M.Sc. Botany, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2021

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(B) Practical Examination Programme

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XII
 (Environmental Biology)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. State and explain how human activity is the major threat to biodiversity ?
2. Give an account of major Biomes of the World.
3. Write short notes on :—
 (a) Energy flow concept of Ecosystem (b) Food Web
4. In detail discuss interaction among population of the World.

Or

Define population. Give a concise account of various characteristics of population of organisms.

5. Write an essay on Air Pollution. Suggest remedy to minimize it.
6. Define restoration, remediation and reclamation. Give examples of each.
7. What is Genecology ? Describe various types of ecological groups of population.
8. Write short notes on :—
 (a) Positive interaction (b) Biomagnification
 (c) Significance of western Ghats (d) Hot spots of biodiversity in India
9. Describe the concept of ecological management ? Describe principles and goals of this management.
10. Acquaint with natural disasters and write how to mitigate their hazards.

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Revised Programme M.Sc. Botany, Part–II

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(B) Practical Examination Programme

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XIII
(Plant Resources, Utilization and Conservation)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Describe protocol for tissue culture of plant part.
2. What are the principles and strategy of *in situ* conservation.
3. Write short notes on any **Two** of the following :—
 - (a) World Centres of primary diversity of cultivated plant
 - (b) Importance of bio-reserves in conservation
 - (c) Name five sanctuaries of India and their importance
4. Write short notes on :—
 - (a) Write the names of five organization of DBT and their research activity
 - (b) Organizational set up of ICAR
5. What are fibres ? Describe different types of fibre of commercial use.
6. Name five oil yielding plants with its family, Botanical names and use.
7. Describe the method of protoplast isolation and its culture.
8. Name five Medicinal plants with its family, Botanical name and available active ingredients.
9. Describe different reasons for depletion of biodiversity. Describe few steps to overcome this problem.
10. Name :
 - (a) Five timber yielding plants
 - (b) Five cereal yielding plants
 - (c) Plant products used in poultry feeds
 - (d) Five botanical gardens and its location

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER-XIV
 (Ethnobotany)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is the importance of Ethnobotany in Botanical research ?
2. Highlight the importance of indigenous medicinal plants, how can it help in deciding future strategy.
3. Describe different methods of storage of herbal drugs.
4. What are scientific principles adopted for identification of a plant. What is its importance.
5. Name the original homeland of some important crops. Mention Vavilov's contribution in origin and cultivation of plants.
6. Write short notes on :—
 (a) Export potential of medicinal plants in India
 (b) Ethnobotany of plants used in building materials
7. Write short notes on :—
 (a) CITES (b) IUCN
 (c) Seed gene bank (d) Cryo preservation
8. Write short notes on :—
 (a) Ethnobotany of religious plants
 (b) Ethnobotany of plants used for making agricultural implements
9. Mention the ex-situ conservation strategies.
10. What are Vitamins ? Describe the sources of different vitamins.

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Revised Programme M.Sc. Botany, Part-II

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NALANDA OPEN UNIVERSITY
M.Sc. Botany, Part-II
PAPER–XV
(Aerobiology)
Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Give an account of source of Allergy and its various response.
2. Write an essay on aeromycoflora.
3. Write short notes on any **Two** of the following :—
 - (a) Immunity
 - (b) Food allergy
 - (c) Allergens its kind
 - (d) Air borne allergy diseases
4. Role of pollen grain in causing allergy reaction.
5. Describe aerobiology in relation to plant pathology.
6. Write short notes on :—
 - (a) Structure of different types of pollen
 - (b) Different kinds of asexual spores of fungi
7. What is difference between Prokaryote and Eukaryote. Give a detail account.
8. Write short notes on any **Two** of the following :—
 - (a) Air borne culturable microorganisms
 - (b) Viable and non-viable atmospheric air borne microorganisms
 - (c) Clinical and environmental microbiology
9. Write short notes on :—
 - (a) Forecasting in relation to Aerobiology
 - (b) Sampling principles for collection of microorganisms
10. Describe the post-fertilization changes leading to the formation of Ascospore

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Revised Programme M.Sc. Botany, Part–II

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NALANDA OPEN UNIVERSITY

M.Sc. Botany, Part-II

PAPER-XVI

(Biotechnology and Bioinformatics)

Annual Examination, 2021

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

- Describe the technique involved in production of Somatic hybrids.
- Describe the role of Recombinant DNA technology in Agriculture.
- Write short notes on any **Two** of the following :—
 - RH factor
 - Anther culture-protocol
 - Somatic embryogenesis
 - Antigens
- What is a Vector in Recombinant DNA technology ? Describe different types of Vector.
- Write short notes on any **Two** of the following :—
 - Cryopreservation
 - Cybrids
 - Artificial seed
 - Isolation of protoplast
- What do you mean by PCR ? How this technique is used to amplify DNA.
- Describe the technique of Southern blotting.
- Write short notes on :—
 - Proteomics
 - Central Processing Unit (CPU)
 - Blast
 - Cell mediated and humoral immunity
- What are secondary metabolites ? Describe how and when secondary metabolites are produced by plants.
- Write short notes on :—
 - Genetic counselling
 - Micro array technique

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Revised Programme M.Sc. Botany, Part-II

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