

# Nalanda Open University

Annual Examination - 2023

B.Sc. Botany (Honours), Part-I

Paper-I

Time: 3.00 Hrs.

Full Marks: 80

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

1. Describe Ultrastructure of Cynophycean Cell. Give well labeled diagram.
2. Describe the structure and reproduction in *Oedogonium*.
3. Give an account of structure and reproduction in *Chara*.
4. What do you mean by Autoecious and Heteroecious rust? Describe the life cycle of *Puccinia* on Wheat. Give suitable diagrams.
5. Describe the life cycle of *Alternaria*. Name of the disease caused by *Alternaria solani*.
6. Describe the Sporophyte of *Anthoceros*. What light it throws in the evolution of Land plants?
7. Describe the Sporophyte of *Sphagnum*. Give well labelled diagrams.
8. Throw significant light on the Morophological nature of Sporocarp of *Marsilea*.
9. What do you mean by Heterospory and Seed habit? Describe Heterospory and Seed habit in *Selaginella*.
10. Write short notes on any Four of the following :-
  - (a) Elaters
  - (b) Cup of Peziza
  - (c) Palmella stage
  - (d) Gemma cup
  - (e) Protostele
  - (f) Globule and Nucule



## EXAMINATION PROGRAMME, 2023

### B.Sc. Botany, (Hons.), Part-I

Date	Papers	Time	Examination Centre
01.09.2023	Honours Paper-I	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
05.09.2023	Honours Paper-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
07.09.2023	Hindi Composition-100 or Hindi-50 + Urdu-50 or Eng-50	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
12.09.2023	Chemistry (Sub)-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
13.09.2023	Mathematics (Sub)-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
14.09.2023	Zoology (Sub)-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
15.09.2023	Physics (Sub)-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
16.09.2023	Botany (Sub)-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
18.09.2023	Geography (Sub) P-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
19.09.2023	Home Science (Sub) P-I	10.30 AM to 1.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-I**  
**Paper-II**

**Time: 3.00 Hrs.**

**Full Marks: 80**

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

1. Describe the Angiospermic characters of *Gnetum*.
2. Give an account of development of female gametophyte of *Pinus*. Give suitable diagrams.
3. What do you mean by Fossil? Mention Fossil flora of Bihar. Describe the life-cycle of any one of them.
4. Give an account of structure of Strobilus of *Rhynia*.
5. Describe the seed of *Lyginopteris*. Enumerate its phylogenetic importance.
6. Describe Bentham and Hooker's system of classification of Angiosperms.
7. Give Floral characters, Floral diagram and Floral formula of any one of the following:  
(a) Ranunculaceae                      (b) Lamiaceae                      (c) Fabaceae
8. Describe different types of fructifications of *Calamites*.
9. Describe the development of female gametophyte of *Taxus* with well labeled diagrams.
10. Write short notes on any **Two** of the following:  
(a) Types of Racemose Inflorescence    (b) Transfusion tissue    (c) Strobilus of cycadeoidea  
(d) Botanical name and family of four plants of any family as per your syllabus.  
(e) International code of Botanical Nomenclature.



**Programme of B.Sc. Part-I Botany (Hons.)**  
**Practical Counselling and Examination, 2023**  
**Venue : 1st Floor, Botany Lab, Biscomaun Tower, Patna**

**(A) Practical Counselling Class**

<i>Enrollment No.</i>	<i>Date</i>	<i>Time</i>	<i>Paper</i>
<i>All Old &amp; New Students</i>	<i>08.09.2023</i>	<i>09.00 AM to 01.00 PM</i>	<i>I &amp; II</i>

**(B) Practical Examination, 2023**

<i>Enrollment No.</i>	<i>Date</i>	<i>Paper</i>	<i>Paper</i>
<i>All Old &amp; New Students</i>	<i>09.09.2023</i>	<i>I</i>	<i>II</i>

# Nalanda Open University

## Annual Examination - 2023

### B.Sc. Botany (Subsidiary), Part-I

#### Paper-I

Time: 3.00 Hrs.

Full Marks: 80

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

1. Describe the economic importance of Bacteria.
2. Give an account of structure and properties of Tobacco Mosaic Virus (TMV). Give well-labelled diagram.
3. Describe structure and reproduction in *Oedogonium*.
4. Describe the reproduction in lichens.
5. Describe the life cycle of *Albugo*.
6. Give an account of structure and reproduction in *Chara*.
7. What do you mean by Heterospory and Seed habit. Describe Heterospory and Seed habit in *Selaginella*.
8. Describe the development of Male gametophyte in *Pinus* with suitable sketches.
9. Describe floral characters, floral formula and floral diagram of family Labiatae. Give Botanical name of two plants of this family.
10. Write short notes on any **four** of the following:
  - (a) Gemma Cup
  - (b) Elater
  - (c) Verticillaster Inflorescence
  - (d) Zygomorphic flower
  - (e) Cup of Peziza
  - (f) Heterocyst



**B.Sc. Botany (Subsidiary), Part-I, for All Honours,  
Annual Practical Counselling and Examination 2023  
Venue: 1st Floor, Botany Lab, Biscomaun Tower, Patna-1  
(A) Practical Counselling Class 2023**

Date	Enrollment No.	Batch	Paper	Time
20-09-2023	All Old and New Honours Students of Chemistry Honours, Physics Honours, Math Honours, Geography Honours, Home Science Honours, & Yoga Honours,	B1	I	08:00 AM to 09:30 AM
20-09-2023	All old students of Zoology Honours, & New Students 220510001 to 220510010	B2	I	09:30 AM to 11:00 AM
20-09-2023	Zoology Honours, 220510011 to 220510114	B3	I	11:00 AM to 12:30 PM
20-09-2023	220510115 to 220510206	B4	I	01:00 PM to 02:30 PM
20-09-2023	220510207 to 220510311	B5	I	02:30 PM to 04:00 PM
20-09-2023	220510312 to 220510412	B6	I	04:30 PM to 06:00 PM
21-09-2023	220510413 to 220510500	B7	I	08.00 A.M. to 09.30. AM

**(B) Annual Practical Examination 2023**

Date	Enrollment No.	Batch	Paper	Time
23-09-2023	All Old and New Honours Students of Chemistry Honours, Physics Honours, Math Honours, Geography Honours, Home Science Honours, & Yoga Honours,	B1	I	09:00 AM to 11:00 AM
23-09-2023	All old students of Zoology Honours, & New Students 220510001 to 220510010	B2	I	11:00 AM to 01:00 PM
23-09-2023	Zoology Honours, 220510011 to 220510114	B3	I	01:30 PM to 03:30 PM
24-09-2023	220510115 to 220510206	B4	I	09:00 AM to 11:00 AM
24-09-2023	220510207 to 220510311	B5	I	11:00 AM to 01:00 PM
24-09-2023	220510312 to 220510412	B6	I	01:30 PM to 03:30 PM
24-09-2023	220510413 to 220510500	B7	I	03.30 P.M. to 05.30. PM

**Nalanda Open University**  
**Annual Examination - 2021**  
**B.Sc. Botany (Subsidiary), Part-I**  
**Paper-I**

**Time: 3.00 Hrs.**

**Full Marks: 80**

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

1. Describe properties and structure of a *Tobacco Mosaic Virus*.
2. Describe structure and reproduction of *Oedogonium*.
3. Describe life cycle of *Albugo*.
4. Give an account of sporophyte of *Marchantia*.
5. Describe the strobilus of *Selaginella*. What is its significance in heterospory?
6. Describe the mode of reproduction in a Pteridophyte studied by you.
7. Describe any four of the following:
 

(a) Apocarpous	(b) Actinomorphic	(c) Cyathium
(d) Verticillaster	(e) Placentation	(f) Floral diagram
8. Describe floral characters, floral formula and floral diagram of family. *Lamiaceae*. Write botanical names of two plants of the family.
9. Describe Male gametophyte of *Pinus*.
10. Assign the following plants to their family.
 

(a) Potato	(b) Turnip	(c) Banana	(d) Riccinus
(e) Rice	(f) Wheat	(g) Mentha	(h) Mango



**B.Sc. Botany (Subsidiary), Part-I, for All Honours,**  
**Annual Practical Counselling and Examination 2023**  
**Venue: 1st Floor, Botany Lab, Biscomaun Tower, Patna-1**  
**(A) Practical Counselling Class 2023**

Date	Enrollment No.	Batch	Paper	Time
20-09-2023	All Old and New Honours Students of Chemistry Honours, Physics Honours, Math Honours, Geography Honours, Home Science Honours, & Yoga Honours,	B1	I	08:00 AM to 09:30 AM
20-09-2023	All old students of Zoology Honours, & New Students 220510001 to 220510010	B2	I	09:30 AM to 11:00 AM
20-09-2023	Zoology Honours, 220510011 to 220510114	B3	I	11:00 AM to 12:30 PM
20-09-2023	220510115 to 220510206	B4	I	01:30 PM to 02:30 PM
20-09-2023	220510207 to 220510311	B5	I	02:30 PM to 04:30 PM
20-09-2023	220510312 to 220510412	B6	I	04:30 PM to 06:00 PM
21-09-2023	220510413 to 220510500	B7	I	08.00 A.M. to 09.30. AM

**(B) Annual Practical Examination 2023**

Date	Enrollment No.	Batch	Paper	Time
23-09-2023	All Old and New Honours Students of Chemistry Honours, Physics Honours, Math Honours, Geography Honours, Home Science Honours, & Yoga Honours,	B1	I	09:00 AM to 11:30 AM
23-09-2023	All old students of Zoology Honours, & New Students 220510001 to 220510010	B2	I	11:00 AM to 01:00 PM
23-09-2023	Zoology Honours, 220510011 to 220510114	B3	I	01:30 PM to 03:30 PM

24-09-2023	220510115 to 220510206	B4	I	09:00 AM to 11:00 AM
24-09-2023	220510207 to 220510311	B5	I	11:00 AM to 01:00 PM
24-09-2023	220510312 to 220510412	B6	I	01:30 PM to 03:30 PM
24-09-2023	220510413 to 220510500	B7	I	03.30 P.M. to 05.30. PM

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-II**  
**Paper-III**

**Time: 3.00 Hrs.**

**Full Marks: 80**

*Answer Five questions, selecting atleast one question from each group A, B and C.  
All questions carry equal marks.*

**Group - A (Microbiology)**

1. Give an account of degradation of Agriculture produce by microbes.
2. Describe the Ultrastructure of a Bacterial cell. Give well labeled diagram.
3. Describe Ultrastructure of Tobacco Mosaic Virus (TMV). How it replicates?

**Group - B (Plant Pathology)**

4. What is Toxin? Describe the role of Toxins in Plant disease development.
5. Describe etiology, symptom and control measures of *Wilt of Pigeon Pea*.
6. Name of the fungus which causes late Blight of Potato. Describe the life-history of this fungus.
7. Write short notes on any two of the following:  
(a) Citrus Canker (b) Early Blight of Potato  
(c) Little leaf of Brinjal (d) White Rust of Crucifers

**Group - C (Embryology)**

8. Describe development of any one type of Embryo-sac studied by you.
9. Give an account of development of Megaspore in Angiosperms.
10. Write short-notes on any two of the following.  
(a) Double fertilization and Triple fusion (b) Endosperm  
(c) Apomixis (d) Tissue culture and its significance



**EXAMINATION PROGRAMME, 2023**  
**B.Sc. Physics, Chemistry, Botany, Zoology**  
**& Mathematics (Hons.), Part-II**

<b>Date</b>	<b>Papers</b>	<b>Time</b>	<b>Examination Centre</b>
16.08.2023	Honours Paper-III	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
18.08.2023	Honours Paper-IV	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
21.08.2023	Hindi Composition-100 or Hindi-50 + Urdu-50 or Eng-50	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
12.09.2023	Zoology (Sub)-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
13.09.2023	Geography (Sub) P-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
14.09.2023	Mathematics (Sub)-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
15.09.2023	Botany (Sub)-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
16.09.2023	Physics (Sub)-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
18.09.2023	Chemistry (Sub)-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna
20.09.2023	Home Science (Sub) P-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 <sup>nd</sup> Floor, Biscomaun Bhawan, Patna

**Nalanda Open University, Patna**  
*Programme of B.Sc. Part-II Botany (Hons.),*  
**Practical Class and Practical Examination, 2023**  
Venue:- 1st Floor, Botany Lab, Biscomaun Tower, Patna

**(A) Practical Counselling Class For all Students**

<i>Date</i>	<i>Enrollment No</i>	<i>Paper</i>	<i>Time</i>
<b>19.08.2023</b>	All Old & New Students	III & IV	<b>11.00 AM to 03.30 PM</b>

**(B) Practical Examination 2022 for all Students**

<i>Date</i>	<i>Enrollment No</i>	<i>Paper</i>	<i>Time</i>
<b>23.08.2023</b>	All Old & New Students	III	<b>11.00 AM to 02.00 AM</b>
		IV	<b>02.30 PM to 05.30 PM</b>

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-II**  
**Paper-IV**

**Time: 3.00 Hrs.**

**Full Marks: 80**

*Answer Five questions, selecting atleast one question from each group A, B and C.  
All questions carry equal marks.*

**Group - A (Anatomy)**

1. What do you mean by Mechanical tissue? Describe the distribution of Mechanical tissues in Plants.
2. What is Anomalous Secondary Growth? Give an account of Anomalous Secondary Growth in *Boerhaavia*. Give suitable diagram.
3. Describe Anatomical characters of Hydrophytes .
4. Write short notes on any **two** of the following:  
(a) Bark (b) Periderm  
(c) Lenticel (d) Elements of xylem

**Group - B (Cell Biology)**

5. How DNA replicates in Eukaryotes? Explain giving suitable sketches.
6. Describe detailed structure of Power House of the cell (Mitochondria). Mention its fuctions.
7. With the help of suitable sketches, describe the different stages of Mitosis. What is its Significance.
8. What are Vitamins ? Give an account of Vitamin B.

**Group - C (Economic Botany)**

9. Give an account of Pulses Yielding Plants of Bihar.
10. Write Botanical name and family of:  
(a) Two Spices Yielding Plants. (b) Two Medicinal Plants  
(c) Two Timber Yielding Plants (d) Two Fiber Yielding Plants



**Nalanda Open University, Patna**  
*Programme of B.Sc. Part-II Botany (Hons.),*  
*Practical Class and Practical Examination, 2023*  
Venue:- 1st Floor, Botany Lab, Biscomaun Tower, Patna  
**(A) Practical Counselling Class For all Students**

<i>Date</i>	<i>Enrollment No</i>	<i>Paper</i>	<i>Time</i>
<b>19.08.2023</b>	All Old & New Students	III & IV	<b>11.00 AM to 03.30 PM</b>

**(B) Practical Examination 2023 for all Students**

<i>Date</i>	<i>Enrollment No</i>	<i>Paper</i>	<i>Time</i>
<b>23.08.2023</b>	All Old & New Students	III	<b>11.00 AM to 02.00 PM</b>
		IV	<b>02.30 PM to 05.30 PM</b>



**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Subsidiary), Part-II**  
**Paper-II**

**Time: 3.00 Hrs.**

**Full Marks: 80**

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

1. Describe Root-Stem Transition in Plants with suitable diagrams.
2. Give an account of Double fertilization in Angiosperms.
3. Describe the Ultrastructure of Mitochondria.
4. Describe different stages of Mitosis with well labelled diagrams.
5. Give an account of Glycolysis in Plants.
6. What do you mean by Ecosystem? Describe a Forest ecosystem.
7. Write an essay on Air Pollution.
8. What is Food Chain? Describe any Food chain studied by you.
9. Give an account of Drug yielding Plants of Bihar. Write their Botanical names and medicinal value.
10. Write short notes on any four the following:
  - (a) Structure of DNA
  - (b) Green House Effect
  - (c) Meristem
  - (d) Two fiber yielding plants
  - (e) Acid rain
  - (f) Significance of Transpiration



**Practical Counselling Classes and Practical Examination Programme, 2023 of  
 B.Sc., Part-II (Botany Subsidiary, Paper-II)  
 Venue : Botany/Zoology Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna**

**PRACTICAL COUNSELLING CLASS PROGRAMME-2023**

Date	Time	Time	Time	Time
21.09.2023	09.00 AM to 11.00 AM	11.00 AM to 01.00 PM	1.30.00 PM to 03.30 PM	03.30.00 PM to 05.30 PM
	All Students of Chemistry (Hons.), Physics (Hons.), Math (Hons.) Yoga (Hons.), Home Sc. (Hons.) and Geography (Hons.) <u>Zoology (Hons.), Roll No.</u> 190510001-190510500 200510001-200510230	<u>Zoology Hon's Roll No.</u> 200510231 to 200510700 and 210510001 to 210510075	<u>Zoology Hon's Roll No.</u>  210510076 To 210510265	<u>Zoology Hon's Roll No.</u>  210510266 to 210510700

**PRACTICAL EXAMINATION PROGRAMME-2023**

Date	Time	Time	Time	Time
22.09.2023	09.00 AM to 11.00 AM	11.00 AM to 01.00 PM	1.30.00 PM to 03.30 PM	03.30.00 PM to 05.30 PM
	All Students of Chemistry (Hons.), Physics (Hons.), Math (Hons.) Yoga (Hons.), Home Sc. (Hons.) and Geography (Hons.) <u>Zoology (Hons.), Roll No.</u> 190510001-190510500 200510001-200510230	<u>Zoology Hon's Roll No.</u> 200510231 to 200510700 and 210510001 To 210510075	<u>Zoology Hon's Roll No.</u>  210510076 To 210510265	<u>Zoology Hon's Roll No.</u>  210510266 to 210510700

**Practical Counselling Classes and Practical Examination Programme, 2023 of  
B.Sc., Part-II (Botany Subsidiary, Paper-II)  
Venue : Botany/Zoology Lab, 1<sup>st</sup> Floor, Biscomaun Tower, Patna**

**PRACTICAL COUNSELLING CLASS PROGRAMME-2023**

<i>Date</i>	<i>Time</i>	<i>Time</i>	<i>Time</i>	<i>Time</i>
21.09.2023	09.00 AM to 11.00 AM	11.00 AM to 01.00 PM	1.30.00 PM to 03.30 PM	03.30.00 PM to 05.30 PM
	All Students of Chemistry (Hons.), Physics (Hons.), Math (Hons.) Yoga (Hons.), Home Sc. (Hons.) and Geography (Hons.) <u>Zoology (Hons.), Roll No.</u> 190510001-190510500 200510001-200510230	<u>Zoology Hon's Roll No.</u> 200510231 to 200510700 and 210510001 to 210510075	<u>Zoology Hon's Roll No.</u>  210510076 To 210510265	<u>Zoology Hon's Roll No.</u>  210510266 to 210510700

**PRACTICAL EXAMINATION PROGRAMME-2023**

<i>Date</i>	<i>Time</i>	<i>Time</i>	<i>Time</i>	<i>Time</i>
22.09.2023	09.00 AM to 11.00 AM	11.00 AM to 01.00 PM	1.30.00 PM to 03.30 PM	03.30.00 PM to 05.30 PM
	All Students of Chemistry (Hons.), Physics (Hons.), Math (Hons.) Yoga (Hons.), Home Sc. (Hons.) and Geography (Hons.) <u>Zoology (Hons.), Roll No.</u> 190510001-190510500 200510001-200510230	<u>Zoology Hon's Roll No.</u> 200510231 to 200510700 and 210510001 To 210510075	<u>Zoology Hon's Roll No.</u>  210510076 To 210510265	<u>Zoology Hon's Roll No.</u>  210510266 to 210510700

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-III**  
**Paper-V (Plant Physiology and Biochemistry)**

**Time: 3.00 Hrs.**

**Full Marks: 80**

*Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.*

1. Multiple choice questions:
  - (i) Movement of leaves in sensitive plant *Mimosa pudica* is due to:
    - (a) Seismonasty
    - (b) Thermonasty
    - (c) Hydrotropism
    - (d) Chemonasty
  - (ii) Gibberlins promote:
    - (a) Seed dormancy
    - (b) Seed germination
    - (c) Leaf fall
    - (d) Root elongation
  - (iii) From the biological point of view solutions can be grouped into:
    - (a) Isotonic solution
    - (b) Hypotonic solution
    - (c) Hypertonic solution
    - (d) All of these
  - (iv) Source of liberated Oxygen in Photosynthesis is:
    - (a) Carbon dioxide
    - (b) Sulphur dioxide
    - (c) Both (a) and (b)
    - (d) None of these
  - (v) A Nucleotide base not present in DNA is:
    - (a) Adenine
    - (b) Guanine
    - (c) Uracil
    - (d) Thymine
  - (vi) The Key compound in Calvin cycle is:
    - (a) PGA
    - (b) PGAL
    - (c) DHAP
    - (d) DPGA
  - (vii) The factor which decreases Transpiration is:
    - (a) Water
    - (b) Humidity
    - (c) Wind
    - (d) Light
  - (viii) Which of the following is known as Hatch-Slack pathway?
    - (a) C<sub>3</sub>
    - (b) C<sub>4</sub>
    - (c) Both (a) and (b)
    - (d) None of these.
2. Describe the Glycolytic Pathway in Plants.
3. Give an account of Oxidative phosphorylation in Plants.
4. Describe the mechanism of opening and closing of stomata in Plants.
5. What are enzymes? Give an account of different types of enzymes found in Plants.
6. Describe the process of Translocation of organic solutes in Plants.
7. Write an essay on Nitrogen cycle.
8. Describe Phytochrome system. How it supports flower initiation.
9. Give an account of role of Gibberlins in the physiology of Plants.
10. Write notes on any **two** of the following:
  - (a) Plasmolysis
  - (b) Condensation of fatty acids and Glycerol
  - (c) Electron transport system
  - (d) Imbibition.



**Programme of B.Sc. Part-III Botany (Hons.)**

**Annual Practical Counselling & Practical Examination - 2023**

Venue : 1st Floor Biology Lab, Biscomaun Tower, Patna - 800 001

**(A) Practical Counselling Botany**

Date	Time	Paper
14.08.2023	09.00 AM to 05.30 PM	V to VIII

**(B) Practical Examination Botany**

Date	Time	Paper
16.08.2023	11.00 AM to 02.00 AM	V
	2.30 PM to 05.30 PM	VI
17.08.2023	11.00 AM to 2.00 AM	VII
	2.30 PM to 05.30 PM	VIII

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-III**  
**Paper-VI (Environmental Biology)**

**Time: 3.00 Hrs.**

**Full Marks: 80**

*Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.*

1. Multiple choice questions:
  - (i) The natural place of an organism or community is known as  
 (a) Biome (b) Niche (c) Habitat (d) Habit
  - (ii) An orchid living on a tree exhibit  
 (a) Predator (b) Parasitic (c) Commensalism (d) Mutaalism
  - (iii) Edaphic factors are related to-  
 (a) Animal cell (b) Man (c) Soil (d) Temperature
  - (iv) A Food chain consists of:-  
 (a) Producers only (b) Consumers only (c) Producers and Consumers  
 (d) Decomposers only
  - (v) To conserve Coral reefs, the Government of India declared one of the following as Marine Park-  
 (a) Gulf of Manar (b) Andaman island (c) Gulf of Kutch (d) Lakshadeep island
  - (vi) The energy flow in an ecosystem is:  
 (a) Always Unidirectional (b) In any direction  
 (c) Always Bi-directional (d) Always downward directional
  - (vii) Choose the odd one-  
 (a) Carbon cycle (b) Nitrogen cycle (c) Oxygen Cycle (d) Phosphorus Cycle
  - (viii) Aerenchyma is found in or well developed in-  
 (a) Halophytes (b) Mesophytes (c) Hydrophytes (d) Xerophytes
2. What do you mean by Ecosystem? Describe various components of an ecosystem giving suitable examples.
3. Throw significant light on Water Pollution.
4. What do you mean by Biological Diversity? What measures can be taken to conserve Biological Diversity?
5. Describe the adaptation in Hydrophytes. Give suitable examples.
6. Describe the different categories of Natural resources.
7. What is Succession? Describe different stages of Succession on Bare rock.
8. Describe different Phyto-geographical regions of India.
9. What is Bio-geochemical Cycle? Describe any one of them in detail.
10. Write short notes on any **two** of the following:
  - (a) Xerophytic adaptation (b) Pond Ecosystem
  - (c) Chipko movement (d) Acid rain



**Programme of B.Sc. Part-III Botany (Hons.)**  
**Annual Practical Counselling & Practical Examination - 2023**  
 Venue : 1st Floor Biology Lab, Biscomaun Tower, Patna - 800 001

**(A) Practical Counselling Botany**

Date	Time	Paper
14.08.2023	09.00 AM to 05.30 PM	V to VIII

**(B) Practical Examination Botany**

Date	Time	Paper
16.08.2023	11.00 AM to 02.00 AM	V
	2.30 PM to 05.30 PM	VI
17.08.2023	11.00 AM to 2.00 AM	VII
	2..30 PM to 05.30 PM	VIII

**Nalanda Open University**  
**Annual Examination - 2023**  
**B.Sc. Botany (Honours), Part-III**  
**Paper-VII (Cytogenetics and Molecular Biology)**

**Time: 3.00 Hrs.**

**Full Marks: 80**

*Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.*

1. Multiple choice questions:
  - (i) Two chromosomes of a pair are known as-
 

(a) Homologous	(b) Gene pair
(c) Analogous	(d) Locus
  - (ii) Which one is an example of Monosomy?
 

(a) $2n-1$	(b) $2n+1$
(c) $2n+2$	(d) None of these
  - (iii) In Down's Syndrome of a male child, the sex complement is:
 

(a) XO	(b) XY	(c) XX	(d) XXY
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  - (iv) Anticodon is present in:
 

(a) mRNA	(b) rRNA	(c) tRNA	(d) None of these
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  - (v) Which of the following has clover leaf shape:
 

(a) mRNA	(b) rRNA	(c) tRNA	(d) None of these
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  - (vi) Genetic instruction for forming a Polypeptide chain is carried to the Ribosome by :
 

(a) t-RNA	(b) rRNA	(c) mRNA	(d) DNA
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  - (vii) Sonalika and Kalyan Sona are the high yielding Varieties of:
 

(a) Rice	(b) Wheat	(c) Maize	(d) Sugar cane
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  - (viii) Chromosome measurement is generally taken during:
 

(a) Interphase	(b) Prophase	(c) Anaphase	(d) None of these.
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2. Define Mitosis. Describe different stages of Mitosis with well labelled diagrams. What is its Significance?
3. Describe Ultrastructure of Chromosome. Give suitable diagram.
4. What is Linkage? Cite an example to explain Linkage.
5. What do you mean by Plant breeding? Explain various methods adopted in Plant breeding.
6. Give an account of Conservation of Germ plasm.
7. What is Cell cycle? Describe different stages of Cell cycle mentioning its significance.
8. How will you prove that DNA is the genetic material?
9. Define Cytoplasmic Inheritance. Give suitable example and its characteristics.
10. Write notes on any **two** of the following:
 

(a) Polytene chromosome	(b) Exon and Intron
(c) Sens and Nonsense Codon	(d) Heterochromatin and Euchromatin



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# Nalanda Open University

Annual Examination - 2023

B.Sc. Botany (Honours), Part-III

Paper-VIII (Genetics)

Time: 3.00 Hrs.

Full Marks: 80

Answer any five questions. Questions No. 1 is compulsory. All questions carry equal marks.

- Multiple choice questions:
  - The distance between the Gene is measured by:
    - Locus
    - Map Units
    - Both (a) and (b)
    - None of these
  - The Structure of chromosome can be best seen at :
    - Prophase
    - Metaphase
    - Anaphase
    - Telophase
  - In Prokaryotes, RNA polymerase catalyses the synthesis of :
    - mRNA
    - rRNA
    - tRNA
    - All of the these.
  - A Trisomic individual has a chromosome number:
    - $2n-1$
    - $2n+2$
    - $2n+1$
    - $2n+3$
  - Who is associated with Green revolution in India:
    - E.J. Butler
    - M.S. Swaminathan
    - B.P. Lal
    - None
  - Initiation codons in Prokaryotes is:
    - AUG
    - UAA
    - UGA
    - None of these
  - Restriction enzymes are found in:
    - Neurospora
    - Virus
    - Bacteria
    - Fungi
  - Which of the following technique is used by Forensic scientist in detection of Crime:
    - DNA fingerprinting
    - Gene therapy
    - DNA Sequencing
    - DNA nicking
- Give an account of PCR methodology for DNA amplification.
- Define Interaction of Gene by citing one example to prove.
- Define Mutation. Mention the types of Mutation and explain any one of them in detail.
- Define Genetic Code. Describe the characteristics of Genetic Code.
- Define Meiosis. Describe the Prophase I of Meiosis giving Well labelled diagrams. Enumerate the significance of Meiosis.:
- Define Conservation of Germ plasm. Explain briefly *in situ* and *ex situ* Conservation.
- Define Genetic engineering. Describe the various applications of Genetic engineering for Human welfare.
- Write short notes on any **two** of the following:
  - Messenger RNA
  - Turners Syndrome
  - Mean
  - Median
- Write short notes on any **two** of the following:
  - Initiation Codon and Termination codon
  - Plasmid Vector
  - Standard error
  - Mode



Programme of B.Sc. Part-III Botany (Hons.)

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