

Nalanda Open University

Annual Examination - 2015

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 the structure of reproductive organs of *Chara*.
2. Describe the structure and reproduction of *Ectocarpus*.
3. Give an account of the structure and reproduction of *Alternaria*.
4. What are the characteristics features of Bryophyta? Give its classification up to the level of orders.
5. Describe the structure of sporogonium of *Pellia* and compare it with that of *Anthoceros*.
6. Describe the characteristic features of Pteridophyta.
7. Give an account of stellar structure of *Lycopodium*.
8. Describe structure and reproduction of Lichen.
9. Compare any **two** pairs of the following:
 - (a) Zoospores of *Oedogonium* and *Vaucheria*
 - (b) Zoospores of *Synchytrium* and *Albugo*
 - (c) Structure of Oogonium and archegonium
 - (d) L.S. cone of *Lycopodium* and *Equisetum*
10. Write notes on any **Four** of the following :
 - (a) Palmella stage
 - (b) Germination of teleutospore
 - (c) Obligate parasite
 - (d) Heterospory
 - (e) Cleistothecium
 - (f) Gemma cup



Examination Programme, 2015

B.Sc (Part – I) All Honours Subjects

(Except Home Science and Geography Honours)

Date	Papers.	Time	Examination Centre
23/3/2015	(Hons) P-I	3.30 to 6.30 pm	Nalanda Open University, Patna
25/3/2015	(Hons) P-II	3.30 to 6.30 pm	Nalanda Open University, Patna
28/3/2015	Rastrabhsha-100 orHindi +Urdu 100-I	3.30 to 6.30 pm	Nalanda Open University, Patna
30/3/2015	Botany (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
31/3/2015	Math (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
01/4/2015	Geography (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
02/4/2015	Chemistry (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
03/4/2015	Home Scince (Sub)-P I	8 to 11 am	Nalanda Open University, Patna
04/4/2015	Zoology (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
06/4/2015	Physics (Sub) P-I	8 to 11 am	Nalanda Open University, Patna

Nalanda Open University

Annual Examination - 2015

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. Give an account of the characteristic features of Gymnosperm.
2. Describe the development of female gametophyte of *Pinus*.
3. Give an account of the development of male gametophyte of *Gnetum*.
4. Describe in brief the fossil flora of Bihar and Jharkhand States.
5. Describe the classification of Angiosperms as proposed by Bentham and Hooker.
6. Write the rules of International Code of Botanical Nomenclature.
7. Write the floral characters of Ranunculaceae. Give floral formula and floral diagram and botanical name of two plants of economic importance.
8. Describe the fructification of *Calamites*.
9. Mention the important principles proposed by Hutchinson for the cause of classification of Angiosperms.
10. Write notes on any Four of the following :
 - (a) Impression
 - (b) Resemblance of Gymnosperm with Pteridophyta
 - (c) Transfusion tissue
 - (d) Verticillaster
 - (e) Cupule of *Lyginopteris*
 - (f) Sproangium of *Rhynia*



Practical Counselling and Examination Programme of B.Sc. Part-I Botany (Hons.)

Venue : 4th Floor, Biology Lab, Biscomaun Bhawan, Patna

Practical Counselling

Date	Paper	Time
07.04.2015 to 08.04.2015	I & II	10.00 AM to 2.00 PM

Practical Examination

Date	Time	Time
	11:00 AM to 2:00 PM	2:30 PM to 5:30 PM
09.04.2015	Paper-I	Paper-II

Examination Programme, 2015

B.Sc (Part – I) All Honours Subjects

(Except Home Science and Geography Honours)

Date	Papers.	Time	Examination Centre
23/3/2015	(Hons) P-I	3.30 to 6.30 pm	Nalanda Open University, Patna
25/3/2015	(Hons) P-II	3.30 to 6.30 pm	Nalanda Open University, Patna
28/3/2015	Rastrabhsha-100 or Hindi + Urdu 100-I	3.30 to 6.30 pm	Nalanda Open University, Patna
30/3/2015	Botany (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
31/3/2015	Math (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
01/4/2015	Geography (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
02/4/2015	Chemistry (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
03/4/2015	Home Science (Sub)-P I	8 to 11 am	Nalanda Open University, Patna
04/4/2015	Zoology (Sub) P-I	8 to 11 am	Nalanda Open University, Patna
06/4/2015	Physics (Sub) P-I	8 to 11 am	Nalanda Open University, Patna

Nalanda Open University

Annual Examination - 2015

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. What are the characteristic features of virus?
2. Describe the structure and reproduction of *Oedogonium*.
3. Describe the structure and reproduction of *Albugo*.
4. Give an account of the reproduction in *Sphagnum*.
5. Describe the structure of cone of *Selaginella* and compare it with that of *Equisetum*.
6. Describe the characteristic features of Pteridophyta.
7. Give an account of the characteristic features of Gymnosperm.
8. Write the meaning of any Four of the following terms and assign them to their respective families :
(a) Apocarpus (b) Zygomorphic (c) Cyathium
(d) Didynamous (e) Verticillaster (f) Spiklet
9. Describe the floral characters, floral formula and floral diagram of Lamiaceae. Also write botanical names of two plants of economic importance.
10. Assign the following plants to their respective family.
(a) *Ranunculus* (b) *Momordica* (c) *Euphorbia*
(d) *Nerium* (e) *Cucumis* (f) *Ricinus*
(g) *Triticum* (h) *Mentha*



Programme of B.Sc. Part-I Botany (Subsidiary)

Practical Counselling and Examination 2015

Venue : 4th Floor, Biology Lab, Biscomaun Bhawan, Patna

Practical Counselling

Date	Time	Batch	Enrollment No.
16.04.2015	8.00 AM to 11:00 AM	B1	All B.Sc. Chemistry, Physics, Mathematics, Geography & Home Science (Hons.) Students
17.04.2015	8.00 AM to 11:00 AM	B2	All Old Students of Zoology (Hons.) & 140510001 to 140510040
18.04.2015	8.00 AM to 11:00 AM	B3	140510041 to 140510100

Practical Examination

Date	Time	Batch	Enrollment No.
20.04.2015	8.00 AM to 11:00 AM	B1	All B.Sc. Chemistry, Physics, Mathematics, Geography & Home Science (Hons.) Students
21.04.2015	8.00 AM to 11:00 AM	B2	All Old Students of Zoology (Hons.) & 140510001 to 140510040
22.04.2015	8.00 AM to 11:00 AM	B3	140510041 to 140510100

Nalanda Open University

Annual Examination - 2015

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 the structure of Tobacco Mosaic Virus.
2. For which purpose bacteria are used in the industries?
3. Give an account of the degradation of agricultural produce by microbes.

Group - B (Plant Pathology)

4. Describe the process involved in infection.
5. Define toxin and describe its role in pathogenesis.
6. What are phytoalexins? Describe their role in defence against pathogens.
7. Give an account of biochemical defence of the host.

Group - C (Embryology)

8. Describe the development of pollen grains.
9. Give an account of the development of *Polygonum* type of embryo sac.
10. Write notes on any Two of the following :
 - (a) Anther culture
 - (b) Double fertilization
 - (c) Induced parthenocarpy
 - (d) Endosperm



Examination Programme, 2015

(Bachelor Of Science (Part-II))

All Subjects Except B.Sc Geography & Home Science (Honours)

Date	Paper	Time	Name of Examination Centre
26/2/2015	HONOURS PAPER – III	8.00 to 11.00 am	Nalanda Open University, Patna
28/2/2015	HONOURS PAPER – IV	8.00 to 11.00 am	Nalanda Open University, Patna
03/3/2015	(SUB.) (Mathematics - II)	8.00 to 11.00 am	Nalanda Open University, Patna
04/3/2015	(SUB.) (Home Science- II)	8.00 to 11.00 am	Nalanda Open University, Patna
09/3/2015	(SUB.) (Chemistry - II)	8.00 to 11.00 am	Nalanda Open University, Patna
10/3/2015	(SUB.) (Zoology - II)	8.00 to 11.00 am	Nalanda Open University, Patna
11/3/2015	(SUB.) (Botany - II)	8.00 to 11.00 am	Nalanda Open University, Patna
12/3/2015	(SUB.) (Physics- II)	8.00 to 11.00 am	Nalanda Open University, Patna
13/3/2015	(SUB.) (Geography -II)	8.00 to 11.00 am	Nalanda Open University, Patna
14/3/2015	Hindi 100 orUr 50+Hn50	8.00 to 11.00 am	Nalanda Open University, Patna

Programme of B.Sc. Part-II Botany (Hons.),

Practical Class and Practical Examination, 2015

Venue:- 4th Floor, Botany Lab, Biscomaun Bhawan, Patna

(A) Practical Counselling Class

Date	Paper	Time
16.03.2015 to 17.03.2015	III & IV	10.00 AM to 2.00 PM

(B) Practical Examination

Date	Time	Time
18.03.2015	11:00 AM to 2:00 PM	2:15 PM to 5:15 PM
	Paper-III	Paper-IV

Nalanda Open University

Annual Examination - 2015

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 (Microbiology)

1. Describe the anatomical features of xerophytic plants.
2. What is periderm? Describe the function of different periderm.
3. What do you mean by abnormal secondary growth? Describe abnormal secondary growth in Boerhaavia.

Group - B (Plant Pathology)

4. Describe the detailed structure of nucleus and function of the parts.
5. What do you mean by lipids? Classify different types of lipids.
6. Define enzymes. Describe the classification of enzymes.
7. Give an account of Vitamin B.
8. Write notes on any four of the following:
(a) Micronutrient (b) Centrosome (c) Nucleotide
(d) Function of Carbohydrate (e) Alkaloids (f) Essential oil

Group - C (Embryology)

9. Give an account of pulses of Bihar state.
10. What are fibres? Describe the fibre yielding plants of Bihar state and mention the uses of fibres extracted from them.



Examination Programme, 2015

(Bachelor Of Science (Part-II))

All Subjects Except B.Sc Geography & Home Science (Honours)

Date	Paper	Time	Name of Examination Centre
26/2/2015	HONOURS PAPER – III	8.00 to 11.00 am	Nalanda Open University, Patna
28/2/2015	HONOURS PAPER – IV	8.00 to 11.00 am	Nalanda Open University, Patna
03/3/2015	(SUB.) (Mathematics - II)	8.00 to 11.00 am	Nalanda Open University, Patna
04/3/2015	(SUB.) (Home Science- II)	8.00 to 11.00 am	Nalanda Open University, Patna
09/3/2015	(SUB.) (Chemistry - II)	8.00 to 11.00 am	Nalanda Open University, Patna
10/3/2015	(SUB.) (Zoology - II)	8.00 to 11.00 am	Nalanda Open University, Patna
11/3/2015	(SUB.) (Botany - II)	8.00 to 11.00 am	Nalanda Open University, Patna
12/3/2015	(SUB.) (Physics- II)	8.00 to 11.00 am	Nalanda Open University, Patna
13/3/2015	(SUB.) (Geography -II)	8.00 to 11.00 am	Nalanda Open University, Patna
14/3/2015	Hindi 100 orUr 50+Hn50	8.00 to 11.00 am	Nalanda Open University, Patna

Programme of B.Sc. Part-II Botany (Hons.),

Practical Class and Practical Examination, 2015

Venue:- 4th Floor, Botany Lab, Biscomaun Bhawan, Patna

(A) Practical Counselling Class

Date	Paper	Time
16.03.2015 to 17.03.2015	III & IV	10.00 AM to 2.00 PM

(B) Practical Examination

Date	Time	Time
18.03.2015	11:00 AM to 2:00 PM	2:15 PM to 5:15 PM
	Paper-III	Paper-IV

Nalanda Open University

Annual Examination - 2015

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. What is mechanical tissue? Describe different types of mechanical tissue.
2. Give an account of root-stem transition.
3. Describe megasporogenesis.
4. What is endosperm? Describe its type and morphological nature.
5. Describe the structure of chloroplast.
6. What is mutation? Describe its different types.
7. Describe the properties of enzymes.
8. Describe Krebs cycle.
9. What do you mean by ecosystem? Describe the forest ecosystem.
10. Write notes on any four of the following:
 - (a) Anomalous secondary growth
 - (b) Double fertilization.
 - (c) Soil conservation
 - (d) Acid rain
 - (e) Nucleolus
 - (f) Water pollution



Examination Programme, 2015

(Bachelor Of Science (Part-II))

All Subjects Except B.Sc Geography & Home Science (Honours)

Date	Paper	Time	Name of Examination Centre
26/2/2015	HONOURS PAPER – III	8.00 to 11.00 am	Nalanda Open University, Patna
28/2/2015	HONOURS PAPER – IV	8.00 to 11.00 am	Nalanda Open University, Patna
03/3/2015	(SUB.) (Mathematics - II)	8.00 to 11.00 am	Nalanda Open University, Patna
04/3/2015	(SUB.) (Home Science- II)	8.00 to 11.00 am	Nalanda Open University, Patna
09/3/2015	(SUB.) (Chemistry - II)	8.00 to 11.00 am	Nalanda Open University, Patna
10/3/2015	(SUB.) (Zoology - II)	8.00 to 11.00 am	Nalanda Open University, Patna
11/3/2015	(SUB.) (Botany - II)	8.00 to 11.00 am	Nalanda Open University, Patna
12/3/2015	(SUB.) (Physics- II)	8.00 to 11.00 am	Nalanda Open University, Patna
13/3/2015	(SUB.) (Geography -II)	8.00 to 11.00 am	Nalanda Open University, Patna
14/3/2015	Hindi 100 orUr 50+Hn50	8.00 to 11.00 am	Nalanda Open University, Patna

Nalanda Open University, Patna

Programme of B.Sc. Part-II Botany (Subs)

Practical Class and Examination, 2015

Venue:- 4th Floor, Biology Lab Biscomaun Bhawan, Patna

(A) Practical Counselling Class

Date	Time	Paper
23.03.2015	10.00 A.M. to 02.00 PM	Botany (Sub)
		II

(B) Practical Examination

Date	Time	Paper
24.03.2015	11.00 A.M. to 02.00 PM	Botany (Sub)
		II

Nalanda Open University
Annual Examination - 2015
B.Sc. Botany (Honours), Part-III
Paper-V (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) Transpiration would be most rapid when :
 - (a) Weather is dry
 - (b) Air is still
 - (c) Atmosphere is fully humid
 - (d) Weather is very dry
 - (ii) Uptake of ions is called active because :
 - (a) Energy is expended
 - (b) Ions move positively
 - (c) Ions move freely
 - (d) Ions are active
 - (iii) In C₄ pathway of carbon fixation first stable product is :
 - (a) Phosphoenol pyruvic acid
 - (b) Pyruvic acid
 - (c) Phosphoglyceric acid
 - (d) None of these
 - (iv) Photosynthesis takes place chiefly in :
 - (a) Red light
 - (b) Blue light
 - (c) Green light
 - (d) Indigo
 - (v) Krebs cycle takes place in :
 - (a) Ribosome
 - (b) Chloroplast
 - (c) Mitochondria
 - (d) ER
 - (vi) How many ATP will be produced during the production of one molecule of Acetyl CoA from one molecule of pyruvic acid?
 - (a) 38
 - (b) 3
 - (c) 8
 - (d) 6
 - (vii) Gibberellin for the first time was obtained from :
 - (a) Lichen
 - (b) Bacteria
 - (c) Alga
 - (d) Fungus
 - (viii) Effect of day light on flowering of a plant is known as :
 - (a) Photorespiration
 - (b) Photoperiodism
 - (c) Phototropism
 - (d) Chemotropism
2. Describe the mechanism of opening and closing of Stomata.
3. Give an account of Hatch and Slack pathway of CO₂ fixation.
4. Mention the Krebs cycle in details.
5. Describe the role of auxins in the physiology of plants.
6. Give an account of the mechanism of geotropism.
7. What are trace elements? What role do these play in the physiology of plants.
8. Give an account of phytochrome system and flower initiation.
9. Explain the different stages of nitrogen cycle.
10. Write notes on any *Two* of the following :
 - (a) Alcoholic fermentation
 - (b) Non-cyclic photophosphorylation
 - (c) Condensation of fatty acid and glycerol
 - (d) Vernalization



For Examination & Practical Programme See Back Page

Nalanda Open University

Annual Examination - 2015

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.

- Multiple choice questions :
 - In which category the phytoplanktons will be placed?
(a) Consumer (b) Decomposer (c) Producer (d) All the above
 - Lithophytes are plants growing on :
(a) Rock (b) Saline soil (c) Sand (d) Acidic soil
 - Which of the following is a halophyte?
(a) *Wolffia* (b) *Lichen* (c) *Opuntia* (d) *Rhizophora*
 - Nitrifying bacteria produce :
(a) $\text{NH}_3 \rightarrow \text{NO}_3$ (b) $\text{NO}_3 \rightarrow \text{N}$
(c) Protein $\rightarrow \text{NH}_3$ (d) None of these
 - Cycling of mineral elements in an ecosystem is called :
(a) Biological cycle (b) Chemical cycle
(c) Biogeochemical cycle (d) Geological cycle
 - Acid rain is formed due to the union of water with :
(a) SO_2 (b) Dust (c) N_2 (d) None of these
 - Hazaribagh National Park is located in :
(a) Bihar State (b) Andhra (c) Karnatak (d) Jharkhand
 - Arsenic in underground water comes from :
(a) Pesticide (b) Radioactive
(c) Fume of automobile (d) Rock
- Explain ecosystem and describe its various components.
- What do you mean by succession? Describe the succession in a bare pond.
- Describe the morphological and anatomical features of plants growing in submerged aquatic condition.
- What is population? Describe the characteristics of population of an organism.
- Give an account of water pollution and write the methods of its control.
- What is conservation? Describe the methods of soil conservation.
- What do you mean by social forestry? Describe the social forestry along with its advantage.
- Describe different categories of natural resources.
- Write notes on *any Two* of the following :
 - Plant indicator (b) Desertification
 - Non-conventional source of energy (d) Protected area



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

Annual Practical Counselling & Practical Examination - 2015

Venue : 4th Floor Biology Lab, Biscomaun Bhawan, Patna - 800 001

Practical Counselling

Date	Time	Paper
26.02.2015 to 01.03.2015	8.00 AM to 11.00 AM	V to VIII

Practical Examination

Date	Time	
	11:00 AM to 2:00 PM	2:30 PM to 5:30 PM
02.03.2015	Paper-V	Paper-VI
03.03.2015	Paper-VII	Paper-VIII

Nalanda Open University

Annual Examination - 2015

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.

1. Multiple choice questions :
 - (i) A ratio of 9 : 3 ; 3 : 1 is modified in complimentary genes to :
(a) 12 : 3 : 1 (b) 13 : 3 (c) 15 : 1 (d) 9 : 7
 - (ii) Duplicate factors show the ratio :
(a) 9 : 6 : 1 (b) 12 : 3 : 1 (c) 15 : 1 (d) 9 : 7
 - (iii) Variation in individual chromosome number of an organism is :
(a) Polyploidy (b) Euploidy (c) Aneuploidy (d) Aberration
 - (iv) A trisomic individual has a chromosome number of :
(a) $2n - 1$ (b) $2n + 2$ (c) $2n + 1$ (d) $2n + 3$
 - (v) Turner's syndrome is due to :
(a) Monosomy (b) Trisomy (c) Tetrasomy (d) Nullisomy
 - (vi) The genetic information is coded in the form of :
(a) Protein (b) Histone (c) DNA (d) ATP
 - (vii) Which does determine the sequence of amino acids in protein?
(a) *r* RNA (b) *t* RNA (c) Genetic Code (d) Gene
 - (viii) Which one of the following techniques is used by forensic laboratory in the detection of crime?
(a) DNA finger printing (b) DNA nicking
(c) DNA sequencing (d) Gene therapy
2. What is epistasis? Explain it with suitable example.
3. Define mutation and discuss point mutation.
4. Explain polyploidy and mention its role in evolution.
5. Describe the causes of different types of chromosomal diseases in man.
6. Give an account of meiosis and its significance.
7. Describe gene replacement therapy.
8. Give an account of germplasm conservation.
9. Write an essay on human genetics.
10. Write notes on *any Two* of the following :
 - (a) Mutation breeding
 - (b) DNA bank
 - (c) Duplicate gene
 - (d) Raphanobrassica

