

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I PAPER-I

(Non-Chordates and Chordates)
Annual Examination, 2019

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 filter feeding in Polychaeta.
2. Give an account of respiratory pigment in invertebrates.
3. Describe ciliary and flagellar movement in Protozoa.
4. Describe hydrostatic movement in Coelenterates.
5. Write notes on any two of the following :
 - (a) Tracheal system
 - (b) Nephridia
 - (c) Pseudo coelomate
 - (d) Species concept

GROUP 'B'

6. Give an account of derivatives of integument in vertebrates.
7. Describe the aortic arches in Amphibia and compare it with aortic arches of mammal.
8. Describe the different air sacs found in birds.
9. What is neoteny or paedogenesis in Amphibian.
10. Write notes on any two of the following:
 - (a) Contour feathers
 - (b) Ctenoid scale
 - (c) Echidna
 - (d) Wheel organ

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Examination Programme, 2019 **M.Sc. Zoology, Part-I**

<i>Date</i>	<i>Papers</i>	<i>Time</i>	<i>Examination Centre</i>
13.07.2019	Paper-I	3.30 PM to 6.30 PM	Nalanda Open University, Patna
16.07.2019	Paper-II	3.30 PM to 6.30 PM	Nalanda Open University, Patna
18.07.2019	Paper-III	3.30 PM to 6.30 PM	Nalanda Open University, Patna
20.07.2019	Paper-IV	3.30 PM to 6.30 PM	Nalanda Open University, Patna
22.07.2019	Paper-V	3.30 PM to 6.30 PM	Nalanda Open University, Patna
24.07.2019	Paper-VI	3.30 PM to 6.30 PM	Nalanda Open University, Patna
26.07.2019	Paper-VII	3.30 PM to 6.30 PM	Nalanda Open University, Patna
30.07.2019	Paper-VIII	3.30 PM to 6.30 PM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I PAPER-II

(Taxonomy, Biodiversity and Conservation)
Annual Examination, 2019

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 taxonomic key ? Give different types of taxonomic keys.
2. Describe various category of species.
3. Describe the process of typification.
4. Describe the application of biosystematic in biology.
5. Write notes on any two of the following :—

(a) Taxon	(b) Species concept
(c) Genetic diversity	(d) Population systematics

GROUP 'B'

6. Describe the various theories of biodiversity variation.
7. Describe Wild Life Conservation in India.
8. Describe characteristics and adaptation in forest biome.
9. Describe the faunal adaptation of marine biome.
10. Write notes on any **Two** of the following :—

(a) Zooplankton	(b) Core Zone
(c) Benthos	(d) Captive breeding

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M.Sc. ZOOLOGY, PART-I

Practical Counselling Classes and Practical Examination Programme, 2019

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

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Date	Paper	Time (Daily)
All Old Students & 180270001 to 180270030	Z1	31.07.2019	I to IV	01.08.2019	V to VIII	10.00 AM to 4.00 PM
180270031 to 180270120	Z2	02.08.2019	I to IV	03.08.2019	V to VIII	10.00 AM to 4.00 PM
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180270221 to 180270370	Z4	11.08.2019	I to IV	12.08.2019	V to VIII	10.00 AM to 4.00 PM
180270371 to 180270531	Z5	18.08.2019	I to IV	19.08.2019	V to VIII	10.00 AM to 4.00 PM

Practical Examination Programme

Date	Time							
	9.00 AM to 11.00 AM		11.00 AM to 01.00 PM		1.30 PM to 3.30 PM		3.30 PM to 5.30 PM	
	Batch	Paper	Batch	Paper	Batch	Paper	Batch	Paper
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06.08.2019	Z1	III	Z1	IV	Z2	III	Z2	IV
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08.08.2019	Z1	VII	Z1	VIII	Z2	VII	Z2	VIII
13.08.2019	Z3	I	Z3	II	Z4	I	Z4	II
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17.08.2019	Z3	VII	Z3	VIII	Z4	VII	Z4	VIII
20.08.2019	Z5	I	Z5	II	Z5	III	—	
21.08.2019	Z5	IV	Z5	V	Z5	VI		
22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY
M.Sc. Zoology, Part-I
PAPER—III
(Ecology, Environmental Biology and Toxicology)
Annual Examination, 2019

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. Discuss nich Concept with Special reference to its ecological significance.
2. The great diversity of tropical rain forest is explained by the competitive exclusion principle, Why ?
3. Describe Nitrogen cycle in detail.
4. What is Ecological Model ? Discuss the fundamentals of ecological model.
5. Write notes on any **Two** of the following:—
 - (a) Pyramid of energy
 - (b) Net productive rate
 - (c) Mutualism
 - (d) Predation

GROUP 'B'

6. Discuss the environmental stress on animals.
7. Discuss the role of light and pressure on the survival of organism.
8. Describe different types of life table with example.
9. Give an account of environmental acts of India.
10. Write notes on any **Two** of the following:—
 - (a) Coastal regulation zone
 - (b) Oxygen toxicity
 - (c) Estuaries
 - (d) Mountain Sickness

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M.Sc. ZOOLOGY, PART-I
Practical Counselling Classes and Practical Examination Programme, 2019
Venue : Zoology Lab, 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

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Practical Examination Programme

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08.08.2019	Z1	VII	Z1	VIII	Z2	VII	Z2	VIII
13.08.2019	Z3	I	Z3	II	Z4	I	Z4	II
14.08.2019	Z3	III	Z3	IV	Z4	III	Z4	IV
16.08.2019	Z3	V	Z3	VI	Z4	V	Z4	VI
17.08.2019	Z3	VII	Z3	VIII	Z4	VII	Z4	VIII
20.08.2019	Z5	I	Z5	II	Z5	III	—	
21.08.2019	Z5	IV	Z5	V	Z5	VI		
22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY

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

(Ethology and Evolution)
Annual Examination, 2019

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 types and role of signals in Communication among animals.
- Give an account of Social organization of insects, giving example of honeybees.
- What do you mean by parental care ? Describe parental in Amphibians.
- Describe in detail Intra Sexual Selection.
- Write notes on any **Two** of the following:—
 - Diapause
 - Orientation
 - Habitat Selection
 - Species Concept

GROUP 'B'

- What do you mean by isolation and also discuss isolating mechanism in detail.
- Write an essay on micro and macro evolution.
- Describe Neo-Darwinism in detail.
- What are the major trends in the evolution of Primates.
- Write notes on any **Two** of the following:—
 - Lethal Mutation
 - Gene Pool
 - Phenotypic variation
 - Neo-Lamarckism

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M.Sc. ZOOLOGY, PART-I

Practical Counselling Classes and Practical Examination Programme, 2019

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

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Date	Paper	Time (Daily)
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180270221 to 180270370	Z4	11.08.2019	I to IV	12.08.2019	V to VIII	10.00 AM to 4.00 PM
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Practical Examination Programme

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08.08.2019	Z1	VII	Z1	VIII	Z2	VII	Z2	VIII
13.08.2019	Z3	I	Z3	II	Z4	I	Z4	II
14.08.2019	Z3	III	Z3	IV	Z4	III	Z4	IV
16.08.2019	Z3	V	Z3	VI	Z4	V	Z4	VI
17.08.2019	Z3	VII	Z3	VIII	Z4	VII	Z4	VIII
20.08.2019	Z5	I	Z5	II	Z5	III	—	
21.08.2019	Z5	IV	Z5	V	Z5	VI		
22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY
M.Sc. Zoology, Part-I
PAPER-V
 (Biochemistry)
Annual Examination, 2019

Time: 3 Hours.

Full Marks: 80

Answer any Five Questions. All Questions carry equal marks.

1. Give an account of significance of active transport.
2. Write notes on the following :—
 (a) Glucose transport.
 (b) Facilitated diffusion.
3. Describe structure and functions of carbohydrate.
4. Give an account of the concept of metabolic pool.
5. Give an account of biological role of plasma lipoproteins.
6. Write an essay on Glycolysis.
7. Write notes on the following :—
 (a) Ketogenesis.
 (b) Hypoglycemia.
8. Describe about the hexose monophosphate shunt pathway.
9. Describe properties and classification of protein.
10. Write notes on any **Two** of the following:—
 (a) Operon concept.
 (b) Ribozyme.
 (c) Na⁺K⁺ pump.
 (d) Enzyme transformation.

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M.Sc. ZOOLOGY, PART-I
Practical Counselling Classes and Practical Examination Programme, 2019
Venue : Zoology 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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Practical Examination Programme

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22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I PAPER-VI

(Cytogenetics and Microbial Genetics)

Annual Examination, 2019

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. With the help of diagram, describe the events of alternative splicing that lead to sex determination in *Drosophila*.
2. Describe the sex-chromosome abnormalities in human being and also mention its syndromes.
3. Describe the methods of heterokaryon selection.
4. State and explain the way of chromatin remodeling.
5. Write notes on any two of the following :—

(a) Nucleosome organization	(b) Polytene chromosome
(c) Bacterial genome	(d) G-Banding

GROUP 'B'

6. Describe the separation of chromosome by flow cytometry.
7. Give an account of fingerprinting technique of DNA and its application.
8. Describe Down's Syndrome & Klinefelter syndrome.
9. Describe the cytogenetic effect of ionizing and non-ionizing radiation.
10. Write notes on any **Two** of the following :—

(a) Transduction	(b) FISH
(c) F-factor	(d) Bacteriophage

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M.Sc. ZOOLOGY, PART-I

Practical Counselling Classes and Practical Examination Programme, 2019

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

Practical Counselling Class Programme

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Practical Examination Programme

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22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I PAPER-VII

(Molecular Biology and Genetics)
Annual Examination, 2019

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. Explain the example of DNA replication in Eukaryotes.
2. Describe the promoter site for initiation of Prokaryotes and Eukaryotes.
3. Describe the process and regulation of export of m-RNA.
4. What is the role of RNA in DNA replication.
5. Write notes on any **Two** of the following:—

(a) Enhancer Site	(b) RNA Editing
(c) Polymerase	(d) Antiterminator

GROUP 'B'

6. What do you mean by chromosome maps ? Explain.
7. Describe mechanism of DNA repair.
8. Describe translation of process in Prokaryotes.
9. Differentiate between transcription and translation.
10. Write notes on any **Two** of the following:—

(a) RELF	(b) Central dogma
(c) Sigma factor	(d) Gene Conversion

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M.Sc. ZOOLOGY, PART-I

Practical Counselling Classes and Practical Examination Programme, 2019

Venue : Zoology 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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Practical Examination Programme

<i>Date</i>	<i>Time</i>							
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22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I PAPER-VIII

(Basic physiology and chemical principles and instrumentation)

Annual Examination, 2019

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 process of electron transport and release of energy.
2. What are radioactive isotope ? Discuss its use in treatment of Disease.
3. Give detailed account of prospects of Biochemical energetics.
4. Describe the process of glycolysis.
5. Write notes on any **Two** of the following:—

(a) Free energy	(b) HMP-Shunt
(c) Energy rich bonds	(d) Buffers

GROUP 'B'

6. Describe in detail the application of photometer.
7. What are the special features of HPCL.
8. What is the use of Colorimeter ? Explain it.
9. Give brief idea of ultra centrifugation.
10. Write notes on any **Two** of the following:—

(a) Limitation of p ^H Scale.	(b) Photo inhibitors
(c) Indicator	(d) X-ray

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M.Sc. ZOOLOGY, PART-I

Practical Counselling Classes and Practical Examination Programme, 2019

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

Practical Counselling Class Programme

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Practical Examination Programme

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22.08.2019	Z5	VII	Z5	VIII	—	—		

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-IX

(Quantitative Biology and Microbiology)

Annual Examination, 2019

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. Define harmonic and geometric mean and also discuss their merits and demerits.
2. Describe the classification and application of Biostatistics.
3. Describe different types of Correlation.
4. Define analysis of variance and discuss one way analysis of variance.
5. Write notes on any **Two** of the following:—
 - (a) Standard error
 - (b) Degree of freedom
 - (c) Error of inference
 - (d) Null hypothesis

GROUP 'B'

6. Describe the various bacterial microbes and diseases related to them.
7. Describe the role of microbes in improvement of Soil and in dairy industries.
8. Give an account of Protozoan microbes and also discuss the related diseases.
9. Describe the status of human genome project and also discuss the importance of Bio-informatics.
10. Write notes on any **Two** of the following:—
 - (a) Antibody
 - (b) Symptoms of AIDS
 - (c) Single cell protein
 - (d) Homology and analogy

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M.Sc. Zoology, Part-II

Programme for Practical Counselling Classes and Practical Examination, 2019

Venue : 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Time (Daily)
140270001 to 160270085	Z1	24.08.2019 & 25.08.2019	IX to XVI	10.00 AM to 4.30 PM
160270086 to 160270799	Z2	26.08.2019 & 27.08.2019	IX to XVI	10.00 AM to 4.30 PM
170270001 to 170270140	Z3	01.09.2019 & 02.09.2019	IX to XVI	10.00 AM to 4.30 PM
170270141 to 170270370	Z4	03.09.2019 & 04.09.2019	IX to XVI	10.00 AM to 4.30 PM
170270371 to 170270570	Z5	11.09.2019 & 12.09.2019	IX to XVI	10.00 AM to 4.30 PM
170270571 to 170270783	Z6	13.09.2019 & 14.09.2019	IX to XVI	10.00 AM to 4.30 PM

Practical Examination Programme

Date	Time							
	9.00 AM to 11.00 AM		11.30 AM to 1.30 PM		1.30 PM to 3.30 PM		4.00 PM to 6.00 PM	
	Batch	Paper	Batch	Paper	Batch	Paper	Batch	Paper
28.08.2019	Z1	IX	Z1	X	Z2	IX	Z2	X
29.08.2019	Z1	XI	Z1	XII	Z2	XI	Z2	XII
30.08.2019	Z1	XIII	Z1	XIV	Z2	XIII	Z2	XIV
31.08.2019	Z1	XV	Z1	XVI	Z2	XV	Z2	XVI
05.09.2019	Z3	IX	Z3	X	Z4	IX	Z4	X
06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
07.09.2019	Z3	XIII	Z3	XIV	Z4	XIII	Z4	XIV
09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-X

(Biotechnology)

Annual Examination, 2019

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'

- Write down the significance of DNA and RNA assay.
- Describe the significance of Northern blotting in the study of gene expression.
- Describe the Working principle of Spectrophotometer giving its two applications.
- What is Colorimeter ? Describe its application in detail.
- Write notes on any **Two** of the following:—
 - HIV Virus
 - Radio active Decay
 - FRET
 - Beta Decay

GROUP 'B'

- Give an account of preparation of histological slides.
- Give an account of principle and application of Flow cytometry.
- What is immunological technique ? Discuss direct and indirect ELISA with Suitable illustrations.
- Write an essay on RIA and its applications.
- Write notes on any **Two** of the following:—
 - TLC
 - Staining
 - Mounting
 - Cytological Fixatives

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M.Sc. Zoology, Part-II

Programme for Practical Counselling Classes and Practical Examination, 2019

Venue : 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Time (Daily)
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170270371 to 170270570	Z5	11.09.2019 & 12.09.2019	IX to XVI	10.00 AM to 4.30 PM
170270571 to 170270783	Z6	13.09.2019 & 14.09.2019	IX to XVI	10.00 AM to 4.30 PM

Practical Examination Programme

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29.08.2019	Z1	XI	Z1	XII	Z2	XI	Z2	XII
30.08.2019	Z1	XIII	Z1	XIV	Z2	XIII	Z2	XIV
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06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
07.09.2019	Z3	XIII	Z3	XIV	Z4	XIII	Z4	XIV
09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II PAPER–XI

(Immunology, Cell & Tissue)
Annual Examination, 2019

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 Secondary Lymphoid organs ? Describe in brief on each of them.
2. Define antigen and antigenicity. Give a descriptive account of properties of Antigen.
3. Give a detailed account of structure of MHC molecules.
4. Describe Comb's and Gell classification of Hypersensitivity.
5. Write notes on any **Two** of the following:—

(a) Natural Killer Cells	(b) Atopy
(c) Mismatched transfusion	(d) Hapten

GROUP 'B'

6. What do you mean by apoprotein ? Describe it in detail.
7. Describe fluid mosaic model of cell membrane.
8. Describe the basic mechanism of cell signalling.
9. Give an account of active transport mechanism across cell membrane.
10. Write notes on any **Two** of the following:—

(a) Integral protein	(b) Glycosis
(c) Cell adhesion	(d) Adipose tissues

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M.Sc. Zoology, Part–II Programme for Practical Counselling Classes and Practical Examination, 2019 Venue : 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Time (Daily)
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Practical Examination Programme

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31.08.2019	Z1	XV	Z1	XVI	Z2	XV	Z2	XVI
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06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
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09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XII

(Parasitology)

Annual Examination, 2019

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 life-cycle of *Entamoeba histolytica*.
2. Describe the role of antigen-antibody reaction in Clinical Parasitology.
3. Give an account of life cycle of *Anclostoma deodenale*.
4. How does Malaria spread from one man to another ? What step would you suggest to protect your house hold from their disease.
5. Write notes on any **Two** of the following:—
 - (a) Sand flies
 - (b) Filariasis
 - (c) Bed Bug
 - (d) B-lymphocyte

GROUP 'B'

6. What do you mean by ELISA ? Describe the different types and their applications.
7. Describe prevention and Control of Poultry diseases.
8. How do the antibodies act against Pathogens.
9. Write about the lymphoid nodes in the context of immune system.
10. Write notes on any **Two** of the following:—
 - (a) Immunoblot
 - (b) IgM
 - (c) Macrophages
 - (d) Bone marrow

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M.Sc. Zoology, Part–II Programme for Practical Counselling Classes and Practical Examination, 2019 Venue : 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

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Practical Examination Programme

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29.08.2019	Z1	XI	Z1	XII	Z2	XI	Z2	XII
30.08.2019	Z1	XIII	Z1	XIV	Z2	XIII	Z2	XIV
31.08.2019	Z1	XV	Z1	XVI	Z2	XV	Z2	XVI
05.09.2019	Z3	IX	Z3	X	Z4	IX	Z4	X
06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
07.09.2019	Z3	XIII	Z3	XIV	Z4	XIII	Z4	XIV
09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XIII

(Developmental Biology)

Annual Examination, 2019

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 fertilization ? Describe the mechanism and biochemistry of fertilization.
2. Write an essay on the process of spermatogenesis.
3. Give an account of development of extra embryonic membrane in Rabbit and its function.
4. Describe the cleavage, blastulation and gastrulation in vertebrates.
5. Write notes on any **Two** of the following:—
 - (a) Microlecithal egg
 - (b) Semination
 - (c) Graafian follicles
 - (d) External fertilization

GROUP 'B'

6. Describe the role of Juvenile hormone and Ecdysone in insects metamorphosis.
7. Describe the significance of totipotency and pluripotency of cell during animal development.
8. Describe the characteristic features and application of Stem Cells.
9. Give an account of role of Thyroxine in Amphibian metamorphosis.
10. Write notes on any **Two** of the following:—
 - (a) Yolk Placenta
 - (b) Telolecithal egg
 - (c) Ecological metamorphosis
 - (d) Allantois

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M.Sc. Zoology, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2019

Venue : 1st Floor, Biscomaun Tower, Patna

Practical Counselling Class Programme

Enrollment No.	Batch	Date	Paper	Time (Daily)
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170270571 to 170270783	Z6	13.09.2019 & 14.09.2019	IX to XVI	10.00 AM to 4.30 PM

Practical Examination Programme

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29.08.2019	Z1	XI	Z1	XII	Z2	XI	Z2	XII
30.08.2019	Z1	XIII	Z1	XIV	Z2	XIII	Z2	XIV
31.08.2019	Z1	XV	Z1	XVI	Z2	XV	Z2	XVI
05.09.2019	Z3	IX	Z3	X	Z4	IX	Z4	X
06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
07.09.2019	Z3	XIII	Z3	XIV	Z4	XIII	Z4	XIV
09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-XIV

(Endocrinology)

Annual Examination, 2019

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 histology of Adrenal gland and mention the function of hormones secreted by the Adrenal Cortex.
2. Describe the physiological action of insulin and Glucagon.
3. Describe the biosynthesis and functions of Adrenal medullary hormones.
4. Describe the process of Spermatogenesis and add a note on mammalian sperm.
5. Write notes on any **Two** of the following:—
 - (a) Cushing's Syndrome
 - (b) Hyperthyroidism
 - (c) STH
 - (d) Acromegaly

GROUP 'B'

6. Discuss the statement "Hormone as messenger".
7. Describe the role of hormones in Carbohydrate metabolism.
8. Describe the histology of ovary and discuss the functions of ovarian hormones.
9. Describe the different diseases produced due to unbalance of different hormones.
10. Write notes on any **Two** of the following:—
 - (a) Emergency hormone
 - (b) Addison's disease
 - (c) Gastrin
 - (d) Graffian follicles

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M.Sc. Zoology, Part-II
Programme for Practical Counselling Classes and Practical Examination, 2019
Venue : 1st Floor, Biscomaun Tower, Patna

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Practical Examination Programme

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29.08.2019	Z1	XI	Z1	XII	Z2	XI	Z2	XII
30.08.2019	Z1	XIII	Z1	XIV	Z2	XIII	Z2	XIV
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05.09.2019	Z3	IX	Z3	X	Z4	IX	Z4	X
06.09.2019	Z3	XI	Z3	XII	Z4	XI	Z4	XII
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16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XV

(Applied Entomology)

Annual Examination, 2019

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 different types of mouth parts in insects.
2. Describe the different kinds of Pheromons found in insects.
3. Give an account of internal and external genitalia in insects.
4. Give an account of metamorphosis in insects.
5. Write notes on any **Two** of the following:—

(a) Spiracles	(b) Insect-hostplant interaction
(c) Viviparity	(d) Hermaphroditism

GROUP 'B'

6. Define Pest. Describe various types of insect Pest.
7. Describe the life history and control of two pests of Vegetables.
8. Describe the role of chemical in the pest management.
9. Describe the methods for estimation of pest population.
10. Write notes on any **Two** of the following:—

(a) Pest of rice	(b) Juvenile hormone
(c) Host plants	(d) Predatory Vertebrates

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M.Sc. Zoology, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2019

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Practical Examination Programme

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18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XVI

(Ichthyology and Inland Fisheries)

Annual Examination, 2019

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 functional organization of telostean gills.
2. Give an account of ecological Status of rivers and Streams.
3. Describe digestive system of herbivore fish *Garra Lameta*.
4. Describe air-breathing organs in a catfish *Heteropneustes fossilis*.
5. Write notes on any **Two** of the following:—
 - (a) Dogfish
 - (b) G.S.I.
 - (c) Gill ventilation
 - (d) Give an examples of atleast five herbivorous fishes.

GROUP 'B'

6. Describe Control of Physico-Chemical factors in the management of Fish farm.
7. What are the objective of fish culture ? Describe fish culture in fresh water.
8. Describe artificial breeding in fishes.
9. Give an account of Prawn culture in seawater in India.
10. Write notes on any **Two** of the following:—
 - (a) Pond fertilization
 - (b) Long drag net
 - (c) Exotic carps
 - (d) Monoculture

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M.Sc. Zoology, Part–II

Programme for Practical Counselling Classes and Practical Examination, 2019

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07.09.2019	Z3	XIII	Z3	XIV	Z4	XIII	Z4	XIV
09.09.2019	Z3	XV	Z3	XVI	Z4	XV	Z4	XVI
16.09.2019	Z5	IX	Z5	X	Z6	IX	Z6	X
17.09.2019	Z5	XI	Z5	XII	Z6	XI	Z6	XII
18.09.2019	Z5	XIII	Z5	XIV	Z6	XIII	Z6	XIV
19.09.2019	Z5	XV	Z5	XVI	Z6	XV	Z6	XVI