

NALANDA OPEN UNIVERSITY

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

(Non-Chordates and Chordates)
Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

*Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.*

GROUP 'A'

1. What is hydrostatic movement? Describe two process of hydrostatic movement in coelenterata.
2. Give an account of the respiratory pigment in Invertebrates.
3. Describe the evolutionary significance of different larval forms of invertebrates.
4. Give an account of the ciliary and flagellar movement in protozoa.
5. Write notes on any two of the following :
 - (a) Nephridia
 - (b) Coelom in Chaetognatha
 - (c) Excretion in crustaceans
 - (d) Auricularia larva

GROUP 'B'

6. Describe the different air-sacs found in Birds.
7. Give an account of the different epidermal glands found in vertebrates
8. Discuss the aortic arches in Amphibia and compare it with the aortic arches of mammal.
9. Write an essay on paedogenesis in Amphibian.
10. Write notes on any two of the following:
 - (a) Leucocytes
 - (b) Renal portal vein
 - (c) Evolution of Heart
 - (d) Ganoid scales

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

Date	Papers	Time	Examination Centre
30.05.2023	Paper-I	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
01.06.2023	Paper-II	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
03.06.2023	Paper-III	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
06.06.2023	Paper-IV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
08.06.2023	Paper-V	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
10.06.2023	Paper-VI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
13.06.2023	Paper-VII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
15.06.2023	Paper-VIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I

PAPER-II

(Taxonomy, Biodiversity and Conservation)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Describe the process of typification.
2. Give an account of the various category of species.
3. Describe the application of biosystematics in biology.
4. Describe the history and theories of biological classification.
5. Write notes on any **two** of the following :—
 - (a) ICZN
 - (b) Ecosystem diversity
 - (c) Cytotaxonomy
 - (d) Nominalism

GROUP 'B'

6. Describe the characteristics and adaption in forest biome.
7. Write an essay on the 'Wild-life' conservation in India.
8. Discuss the various theories of biodiversity.
9. Describe the observation and comprehensive knowledge on direct and indirect census techniques.
10. Write notes on any **Two** of the following :—
 - (a) Nilgiri Biosphere Reserve
 - (b) IBWL
 - (c) Threatened species
 - (d) National Park

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NALANDA OPEN UNIVERSITY
M.Sc. Zoology, Part-I
PAPER—III
(Ecology, Environmental Biology and Toxicology)
Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

*Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.*

GROUP 'A'

1. Describe the various types of life-table and also explain the survivorship curve with suitable examples.
2. Discuss the different types of competition found in nature.
3. Give an account of the mutualism. How mutualism is evolved in nature? Explain.
4. Illustrate the population regulation in nature.
5. Write notes on any **Two** of the following
 - (a) Habitat niche
 - (b) Animal-Animal Interaction
 - (c) Sexual selection
 - (d) Stable age distribution

GROUP 'B'

6. Describe the impact of temperature and rainfall on the physiological processes of an organism.
7. Discuss the basic concept of environment stress and homeostasis.
8. Give an account of the Air (Prevention and Control) Act, 1981 and also mention its merits and demerits.
9. Describe the environmental health in relation to water quality.
10. Write notes on any **Two** of the following
 - (a) Environmental ethics
 - (b) Blue-baby syndrome
 - (c) Oxygen toxicity
 - (d) Tolerance

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY
M.Sc. Zoology, Part-I
PAPER-IV
(Ethology and Evolution)
Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

*Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.*

GROUP 'A'

1. Describe the learned behavior with suitable examples.
2. Write an essay on the 'migration in Birds'.
3. Discuss the mechanism of neural control of behavior.
4. Give an account of the genetical components in the development of behavior.
5. Write notes on any **Two** of the following:—
 - (a) Aggression
 - (b) Association learning
 - (c) Chemical perception
 - (d) Circadian Rhythms

GROUP 'B'

6. Describe the Neo-Darwinism in detail.
7. What are the major trends in the evolution of Primates?
8. What do you mean by isolation and also discuss isolating mechanism in detail.
9. Define variation. Discuss the process of phenotypic variation.
10. Write notes on any **Two** of the following:—
 - (a) Natural Selection
 - (b) Mutation
 - (c) Genetic Drift
 - (d) Phylogenetic tree

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-I

PAPER-V

(Biochemistry)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer any Five Questions. All Questions carry equal marks.

1. Describe the structure and function of carbohydrates.
2. Give an account of β -oxidation of fatty acid.
3. Discuss the biological role of Plasma lipoproteins.
4. Describe the biosynthesis of epinephrine and nor-epinephrine.
5. Explain how energy is obtained from metabolism of amino acid.
6. Discuss the process of glycogenolysis.
7. Describe the role of respiratory chain in the metabolism.
8. Discuss the multiple factors affecting the rates of enzyme catalyzing reactions.
9. Give an account of the genetic causes and symptoms of different types of hyper phenylalanine.
10. Write notes on any **Two** of the following:—
 - (a) Adipose tissue
 - (b) Ribozymes
 - (c) Integral Proteins
 - (d) Polysaccharides

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY
M.Sc. Zoology, Part-I
PAPER-VI

(Cytogenetics and Microbial Genetics)
Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

*Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.*

GROUP 'A'

1. Describe the structure and function of heterochromatin.
2. Discuss the methods of heterokaryon selection.
3. With the help of diagram, describe the sex-determination in *Drosophila*.
4. Describe the sex-chromosome abnormalities of human being and also explain its syndrome.
5. Write notes on any **two** of the following:
 - (a) Bacterial genome
 - (b) Lamp brush Chromosomes
 - (c) Squash Preparation
 - (d) Uniparental disomy

GROUP 'B'

6. Describe the mechanism of conjugation in Bacteria.
7. Discuss the cytogenetic effect of ionizing and non-ionizing radiation.
8. Describe the technic of DNA finger printing. How can you detect the forensic problem.
9. Describe the physical mapping of chromosomes.
10. Write notes on any **Two** of the following:—
 - (a) DNA foot printing
 - (b) T₄ phage
 - (c) Plasmids
 - (d) FISH

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY

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

(Molecular Biology and Genetics)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

*Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.*

GROUP 'A'

1. Describe the mechanism of transcription in prokaryote.
2. Give an account of enzymes and accessory proteins involved in DNA replication.
3. Discuss the process and regulation of export of m-RNA.
4. Give an account of the history and scopes of molecular biology.
5. Write notes on any **Two** of the following:—
 - (a) Lagging strand
 - (b) Nucleosides & nucleotides
 - (c) TATA box
 - (d) Enhancer & Silencer sites

GROUP 'B'

6. What do you mean by chromosome map? Explain.
7. Describe the Holiday junction model of genetic recombination.
8. Discuss the process of DNA repair.
9. Differentiate between transcription and translation.
10. Write notes on any **Two** of the following:—
 - (a) RAPD
 - (b) Reverse transcription
 - (c) Gene cloning
 - (d) Wobble-hypothesis

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY

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

(Basic physiology and chemical principles and instrumentation)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. What are radio active isotope? Discuss its use in the treatment of disease.
2. What oxidative phosphorylation? Discuss the synthesis of ATP.
3. What are free energy? Describe its role in biological reaction.
4. Describe the third law of thermodynamics.
5. Write notes on any **Two** of the following:—
 - (a) Energy-rich bond
 - (b) Indicator
 - (c) Buffer action
 - (d) Hydrophobic interaction

GROUP 'B'

6. Describe in detail the application of photometer.
7. Discuss the principles and application of gas liquid chromatography.
8. Give an account of the thin layer chromatography (TLC).
9. What are photo chemical reaction? How do they differ from dark reaction?
10. Write notes on any **two** of the following:
 - (a) Application of ESR
 - (b) HPCL
 - (c) Paper electrophoresis
 - (d) Decomposition of Ammonia

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परीक्षाफल प्रकाशन से सम्बन्धित आवश्यक सूचना

सम्बन्धित सभी विद्यार्थियों को सूचित किया जाता कि वे अपने विषय के रिजल्ट से सम्बन्धित जानकारी हेतु समय-समय पर (time to time) विश्वविद्यालय के वेबसाईट (www.nou.ac.in) का संदर्भ करेंगे ।

- परीक्षाफल प्रकाशित हो जाने के उपरान्त सभी विद्यार्थियों का e-marksheet उनके Student Login पर मौजूद रहेगा, जिसे वे नालन्दा खुला विश्वविद्यालय में किसी प्रयोजनार्थ व्यवहार में ला सकते हैं ।
- परीक्षा में उत्तीर्ण विद्यार्थी अपने Student Login से निर्धारित तिथियों (जो कि रिजल्ट नोटिस पर मौजूद रहेगा) के अन्तर्गत अगले सत्र में Online Admission लेना सुनिश्चित करेंगे ।

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प्रायोगिक परामर्श कक्षा एवं प्रायोगिक परीक्षा का कार्यक्रम पार पृष्ठ पर देखें ।

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-IX

(Quantitative Biology and Microbiology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Define biostatistics. Discuss the principles and application of biostatistics in various field.
2. Describe the different types of correlation and also discuss its significance.
3. What is probability distribution ? Explain it with their properties.
4. Describe the harmonic and geometric mean and also discuss their merits and demerits.
5. Write notes on any **Two** of the following:—
 - (a) Degree of freedom
 - (b) Levels of significance
 - (c) Frequency distribution
 - (d) Standard deviation

GROUP 'B'

6. Describe the protozoan microbes and its diseases.
7. What is whooping cough ? Describe its microbes, pathogenesis, vaccination & treatment.
8. Discuss the role of microbes in medicine and improvement of soil.
9. Describe the negative impact of microbes in biosphere.
10. Write notes on any **Two** of the following:—
 - (a) Waste water treatment
 - (b) Fermentation
 - (c) Antibiotics
 - (d) Industrial microbiology

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EXAMINATION PROGRAMME-2023

M.Sc. Physics, Chemistry & Zoology, Part-II

Date	Papers	Time	Examination Centre
30.09.2023	Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.10.2023	Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
06.10.2023	Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
09.10.2023	Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.10.2023	Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.10.2023	Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
17.10.2023	Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.10.2023	Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-X

(Biotechnology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Describe the procedures and application of Northern blotting technique.
2. Explain the procedure and advantages of fluorescence method by DNA assay.
3. Describe the working principle of spectrophotometer with applications.
4. Discuss the principle and application of colorimeter in detail.
5. Write notes on any **Two** of the following:—
 - (a) HIV Virus
 - (b) NMR spectroscopy
 - (c) Confocal microscope
 - (d) Radioactive Decay

GROUP 'B'

6. What is apoptosis ? Describe the comet assay technique for the detection of apoptotic cells.
7. What is Fixation ? Give an account of nature of chemical fixing reagent.
8. What do you mean by immunological technique ? Discuss direct and indirect ELISA with suitable illustration.
9. Describe the principle and application of HPLC.
10. Write notes on any **Two** of the following:—
 - (a) Ion Exchange technique
 - (b) SDS-PAGE
 - (c) Biosensor
 - (d) Staining

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EXAMINATION PROGRAMME-2023

M.Sc. Physics, Chemistry & Zoology, Part-II

Date	Papers	Time	Examination Centre
30.09.2023	Paper-IX	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
04.10.2023	Paper-X	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
06.10.2023	Paper-XI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
09.10.2023	Paper-XII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
12.10.2023	Paper-XIII	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
14.10.2023	Paper-XIV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
17.10.2023	Paper-XV	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna
19.10.2023	Paper-XVI	2.30 PM to 5.30 PM	Nalanda Open University, 2 nd Floor, Biscomaun Bhawan, Patna

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II PAPER–XI

(Immunology, Cell & Tissue)
Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.
All Questions carry equal marks.

GROUP 'A'

1. Define hypersensitivity ? Write the Comb's and Gell classification of hypersensitivity.
2. Define antigen and antigenecity. Give a descriptive account of general properties of antigen.
3. What are secondary lymphoid organs ? Write a brief account of each of them.
4. Explain he mechanism of innate immune response.
5. Write notes on any **Two** of the following:—
 - (a) NK cells
 - (b) Mast Cells
 - (c) IgM
 - (d) HLA

GROUP 'B'

6. Give an account of fluid-mosaic model of cell membrane.
7. Describe the various functional consequences of cell membrane.
8. Discuss the structure and functions of cell coat of the cell membrane.
9. Describe the basic mechanism of cell signalling.
10. Write notes on any **Two** of the following:—
 - (a) Trafficking of Protein
 - (b) Second messenger system
 - (c) Apolipo protein
 - (d) AMP kinase

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M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

Venue : 2nd Floor, Biscomaun Bhawan, Patna

Annual Practical Counseling Programme

Enrollment No.	Batch	Date	09:30 AM to 05:30PM	Date	09:30 AM to 05:30PM
			Paper		Paper
180270001-200270200	Z1	10-10-2023	IX-XII	20-10-2023	XIII-XVI
200270201-200271165	Z2				
200271166-210270140	Z3				
210270141-210270300	Z4				
210270301-210270490	Z5	28-10-2023	IX-XII	29-10-2023	XIII-XVI
210270491-210270700	Z6				
210270701-210270900	Z7				
210270901-210271200	Z8				

Annual Practical Examination Programme

Batch	Date	Time		Time	
		07:00 Am to 10:00 AM	10:00 PM to 01:00 PM	01:30 PM to 04:30 PM	04:30 PM to 07:30 PM
Z1 & Z2	26.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	27.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z3 & Z4	28.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	29.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z5 & Z6	30.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	31.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z7 & Z8	01.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	02.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-XII

(Parasitology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

- Describe the structure and life-cycle of *Ancylostoma doudenale*.
- Give an account of the antigen-antibody interaction.
- How does Malaria spread from one man to another and also discuss its control.
- Describe the life-cycle and pathogenic effects of *Entamoeba histolytica*.
- Write notes on any **Two** of the following:—
 - Life-cycle of Bed Bug
 - Sand fly
 - Elephantiasis
 - MHC

GROUP 'B'

- What are antigens ? How do they effect our immune system.
- Describe the prevention and control of Internal Poultry parasitic diseases.
- Describe the role of lymph nodes ad spleen in the immune response.
- Give an account of the different types of ELISA and their application.
- Write notes on any **Two** of the following:
 - Immunoglobulin
 - Liver fluke
 - Poultry mites
 - Western blot

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M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

Venue : 2nd Floor, Biscomaun Bhawan, Patna

Annual Practical Counseling Programme

Enrollment No.	Batch	Date	09:30 AM to 05:30PM	Date	09:30 AM to 05:30PM
			Paper		Paper
180270001-200270200	Z1	10-10-2023	IX-XII	20-10-2023	XIII-XVI
200270201-200271165	Z2				
200271166-210270140	Z3				
210270141-210270300	Z4				
210270301-210270490	Z5				
210270491-210270700	Z6	28-10-2023	IX-XII	29-10-2023	XIII-XVI
210270701-210270900	Z7				
210270901-210271200	Z8				

Annual Practical Examination Programme

Batch	Date	Time		Time	
		07:00 Am to 10:00 AM	10:00 PM to 01:00 PM	01:30 PM to 04:30 PM	04:30 PM to 07:30 PM
Z1 & Z2	26.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	27.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z3 & Z4	28.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	29.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z5 & Z6	30.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	31.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z7 & Z8	01.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	02.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI

NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XIII

(Developmental Biology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

- Describe the process of spermatogenesis and add a note on the structure of a mammalian sperm.
- Discuss the mechanism of ovum transport in mammal.
- Give an account of development of extra-embryonic membrane in amniotes and their functions.
- Describe the process of gastrulation in vertebrates.
- Write notes on any **Two** of the following:
 - Graafian follicles
 - Macrolecithal egg
 - Allantois
 - Ovulation

GROUP 'B'

- Discuss the process of bone marrow transplantation.
- Describe the significance of totipotency of cell during animal development.
- Give an account of the therapeutic use and importance of stem cell.
- Describe the role of thyroxine in amphibian metamorphosis.
- Write notes on any **Two** of the following:
 - Ecdysone
 - Ecological metamorphosis
 - Blastulation
 - Disorder of stem cells

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M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

Venue : 2nd Floor, Biscomaun Bhawan, Patna

Annual Practical Counseling Programme

Enrollment No.	Batch	Date	09:30 AM to 05:30PM	Date	09:30 AM to 05:30PM
			Paper		Paper
180270001-200270200	Z1	10-10-2023	IX-XII	20-10-2023	XIII-XVI
200270201-200271165	Z2				
200271166-210270140	Z3				
210270141-210270300	Z4				
210270301-210270490	Z5	28-10-2023	IX-XII	29-10-2023	XIII-XVI
210270491-210270700	Z6				
210270701-210270900	Z7				
210270901-210271200	Z8				

Annual Practical Examination Programme

Batch	Date	Time		Time	
		07:00 Am to 10:00 AM	10:00 PM to 01:00 PM	01:30 PM to 04:30 PM	04:30 PM to 07:30 PM
Z1 & Z2	26.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	27.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z3 & Z4	28.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	29.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z5 & Z6	30.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	31.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z7 & Z8	01.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	02.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI

आवश्यक सूचना

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-XIV

(Endocrinology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Describe the different diseases produced due to imbalance of different hormones.
2. Discuss the chemistry synthesis and physiological action of Insulin.
3. Describe the histology of pituitary gland and explain the function of hormones secreted by adeno-hypophysis.
4. Discuss the biosynthesis of hormones secreted by thyroid gland.
5. Write notes on any **Two** of the following:
 - (a) Hypothyroidism
 - (b) Oxitocin
 - (c) MSH
 - (d) Gigantism

GROUP 'B'

6. Describe the histology of adrenal cortex and also discuss the biosynthesis of cortical hormones.
7. Give an account of the hormonal control of testosterone production.
8. Describe the statement "hormone as messenger".
9. Discuss the role of hormone in carbohydrate metabolism.
10. Write notes on any **Two** of the following:—
 - (a) Progesterone
 - (b) Menstrual cycle
 - (c) Gastrin
 - (d) Emergency hormone

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M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

Venue : 2nd Floor, Biscomaun Bhawan, Patna

Annual Practical Counseling Programme

Enrollment No.	Batch	Date	09:30 AM to 05:30PM	Date	09:30 AM to 05:30PM
			Paper		Paper
180270001-200270200	Z1	10-10-2023	IX-XII	20-10-2023	XIII-XVI
200270201-200271165	Z2				
200271166-210270140	Z3				
210270141-210270300	Z4				
210270301-210270490	Z5	28-10-2023	IX-XII	29-10-2023	XIII-XVI
210270491-210270700	Z6				
210270701-210270900	Z7				
210270901-210271200	Z8				

Annual Practical Examination Programme

Batch	Date	Time		Time	
		07:00 Am to 10:00 AM	10:00 PM to 01:00 PM	01:30 PM to 04:30 PM	04:30 PM to 07:30 PM
Z1 & Z2	26.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	27.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z3 & Z4	28.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	29.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z5 & Z6	30.10.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	31.10.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z7 & Z8	01.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	02.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI

आवश्यक सूचना

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER–XV

(Applied Entomology)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Describe the different types of mouth-parts of insects.
2. Give an account of the process of respiration in terrestrial insects.
3. Discuss the different kinds of pheromones found in insects.
4. Describe the process of metamorphosis in insects.
5. Write notes on any **Two** of the following:
(a) Polymorphism (b) Sex-determination in Insect
(c) Moulting (d) Colour vision

GROUP 'B'

6. Name two pests of cereals and discuss the life-cycle of any one and its control.
7. Give an account of assessment of insect pest-status.
8. Describe the methods of estimation of pests population.
9. Discuss the biological and microbial control of insect pests and also mention the sterile male technique.
10. Write notes on any **Two** of the following:
(a) Parasitic insects (b) Migrant pests
(c) Organic insecticides (d) Pests of seeds

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Revised

M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

Venue: Zoology / Botany Lab, 1st Floor, Biscamaun Tower / 2nd Floor Biscamaun Bhawan, Patna

Annual Practical Counseling Programme

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Z6	01.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	02.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z7	03.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	04.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z8	05.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	06.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology, Part-II

PAPER-XVI

(Ichthyology and Inland Fisheries)

Annual Examination, 2023

Time: 3 Hours.

Full Marks: 80

Answer five questions in all, selecting at least Two Questions from each Group.

All Questions carry equal marks.

GROUP 'A'

1. Describe the functional organization of teleostean gills.
2. Give an account of the air-breathing organs of Heteropneustes fossilis.
3. Describe the food, feeding and physiology of digestion in fishes.
4. Discuss the structure and functions of weberian ossicles.
5. Write notes on any two of the following :
 - (a) Neuromast cell
 - (b) Lamellae
 - (c) Testicular cycle
 - (d) Chondrichthyes

GROUP 'B'

6. Give an account of Protozoan and fungal diseases in fishes and their treatment.
7. What is fish culture ? Describe the fish culture in freshwater.
8. Write an essay on the "estuarine fisheries of India".
9. Describe the control of physio-chemical factors in management in fish farm.
10. Write notes on any **two** of the following:

(a) Hypophysation	(b) Fish liver oil
(c) Bacterial gill disease	(d) Composite culture

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Revised Programme

M.Sc. ZOOLOGY, PART – II,

PROGRAMME FOR ANNUAL PRACTICAL EXAMINATION, 2023

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Z7	03.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	04.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI
Z8	05.11.2023	Paper-IX	Paper-X	Paper-XI	Paper-XII
	06.11.2023	Paper-XIII	Paper-XIV	Paper-XV	Paper-XVI