

NALANDA OPEN UNIVERSITY

M.Sc. Zoology PART-I, PAPER-I (Non-Chordates and Chordates) Annual Examination, 2012

Time : 3 Hours.

Full Marks: 80

*Answer any Five Questions. At least two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Describe the filter feeding mechanism in mollusca.
2. Describe the mechanism of respiration in lower organisms.
3. Give an account of structure and function of excretory organs in Annelida.
4. Give an account of larval forms of crustacea and their evolutionary significance.
5. Write short notes on any *Two* of the following :-
 - (a) Respiratory Pigments.
 - (b) Bipinnaria larva.
 - (c) Acoelomate.
 - (d) Book lung.

GROUP 'B'

6. Classify living reptiles upto class with important characters and examples.
7. Give an account of different types of epidermal glands found in vertebrates.
8. Give a comparative account of brain of amphibia and mammal.
9. What is receptor ? Give an account of different types of receptors found in mammals.
10. Write short notes on any *Two* of the following :-
 - (a) Tadpole larva.
 - (b) Hepatic vein.
 - (c) Lateral line system in fish.
 - (d) Wheel Organ.

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Examination Programme-2012 M.Sc. Zoology, Part-I

Date	Papers	Time	Examination Centre
09.05.2012	Paper-I	8.00 AM to 11.00 AM	Nalanda Open University, Patna
11.05.2012	Paper-II	8.00 AM to 11.00 AM	Nalanda Open University, Patna
15.05.2012	Paper-III	8.00 AM to 11.00 AM	Nalanda Open University, Patna
17.05.2012	Paper-IV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
19.05.2012	Paper-V	8.00 AM to 11.00 AM	Nalanda Open University, Patna
21.05.2012	Paper-VI	8.00 AM to 11.00 AM	Nalanda Open University, Patna
23.05.2012	Paper-VII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
25.05.2012	Paper-VIII	8.00 AM to 11.00 AM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY
M.Sc. Zoology
PART-I, PAPER-II
(Taxonomy, Biodiversity and Conservation)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Describe the process of Typification.
2. What is taxonomic key ? Give an account of different kinds of taxonomic keys.
3. Describe the application of biosystematics in biology.
4. Describe the various theories of biological classification.
5. Write short notes on any *Two* of the following :-
 - (a) Intra-specific species
 - (b) ICZN
 - (c) Species Concept
 - (d) Genetic diversity

GROUP 'B'

6. Describe the observation and comprehensive knowledge on direct and indirect census techniques.
7. Describe in detail about threatened and endangered species.
8. Give an account of global pattern of biodiversity.
9. Explain the term "Wild life" and give reasons for its depletion.
10. Write short notes on any *Two* of the following :-
 - (a) Marine biome
 - (b) Uses of biodiversity
 - (c) N.G.O.
 - (d) Taxon

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NALANDA OPEN UNIVERSITY
M.Sc. Zoology
PART-I, PAPER-III
(Ecology, Environmental Biology and Toxicology)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Discuss the significance of age distribution. What are the possibilities of developing stable age distribution.
2. Describe the different categories of mutualism, How mutualism is evolved in nature ?
3. What is Competition ? Describe the various types of competition found in nature.
4. Give an account of role of predation in nature.
5. Write short notes on any *Two* of the following :-
 - (a) Life-table
 - (b) Generation time
 - (c) Net reproductive rate
 - (d) Niche concept

GROUP 'B'

6. Describe the role of water quality in environmental health.
7. Describe the impact of temperature on various life-processes.
8. Describe the physiology of oxygen deficiency in animals.
9. Give an account of adaptive ability of animals with environmental changes.
10. Write short notes on any *Two* of the following :-
 - (a) Acclimatisation
 - (b) utility of rainfall
 - (c) Solar energy
 - (d) Oxygen toxicity

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—: आवश्यक सूचना :-

M.Sc. Zoology, Part-I के सभी परीक्षार्थियों को सूचित किया जाता है कि पटना नगर निगम चुनाव के कारण दिनांक 17.05.2012 को होने वाली Paper-IV की परीक्षा अब दिनांक 18.05.2012 को प्रातः 8 बजे से 11 बजे के बीच आयोजित की जायेगी । अन्य पत्रों की परीक्षा अपने पूर्व निर्धारित तिथि, समय एवं स्थान पर आयोजित होगी ।

NALANDA OPEN UNIVERSITY

M.Sc. Zoology **PART-I, PAPER-IV** **(Ethology and Evolution)** **Annual Examination, 2012**

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. What do you mean by cognitive skills ? Write about important cognitive skills for successful learning.
2. Write an essay on bird migration.
3. Give an account of "Parental Care in Fishes".
4. Describe the various aspects of habitat selection and mention the factors associated with habitat selection.
5. Write short notes on any *Two* of the following :-
 - (a) Circadian Rhythm
 - (b) Biological Clock
 - (c) Navigation
 - (d) Innate behaviour

GROUP 'B'

6. Describe models explaining changes in genetic structure of population. Explain in short about phenotypic variation.
7. Give an account of destabilizing forces of Neo- Darwinism.
8. Give an account of Lamarkism.
9. Define phylogeny. What do you mean by restriction enzyme sites.
10. Write short notes on any *Two* of the following :-
 - (a) Gene-pool
 - (b) Micro evolution
 - (c) Isolating mechanism
 - (d) Phylogenetic tree

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology

PART-I, PAPER-V

(Animal Physiology and Biochemistry)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Describe the physiological effect of temperature on poikilothermic animals.
2. Give an account of audio signal in animals studied by you.
3. Describe the mechanism of muscle contraction.
4. Give an account of physiological adaptation of marine animals.
5. Write short notes on any *Two* of the following :-
 - (a) Pheromone
 - (b) Ecdysone
 - (c) Bohr's effect
 - (d) Hibernation

GROUP 'B'

6. Describe citric acid cycle and its energetics.
7. Discuss the short term and long term regulation of fatty acid synthesis.
8. Summarize the biological roles of plasma lipoproteins.
9. Describe the process of irreversible covalent activation, using the examples of two gastro intestinal enzymes.
10. Write short notes on any *Two* of the following :-
 - (a) Isozyme
 - (b) Enzyme-substrate interaction
 - (c) Rate-limiting enzyme
 - (d) Lipotropic factors

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology

PART-I, PAPER-VI

(Cytogenetics and Microbial Genetics)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Describe the structural and functional organization of polytene chromosome.
2. What are telomeric sequences ? How is the length of telomere maintained in eukaryotes ?
3. Describe the characterization of human chromosomes on the basis of different banding techniques.
4. Describe the Sex-chromosome abnormalities of human being and also describe its syndrome.
5. Write short notes on any *Two* of the following :-
 - (a) Nucleosome Organization
 - (b) Dosage Compensation
 - (c) Cell Harvesting
 - (d) Non-disjunction

GROUP 'B'

6. Describe the process of DNA fingerprinting and its application.
7. Describe the types, structure and morphology of T₄- Phage.
8. Describe the genetic regulation of cell cycle in eukaryotes.
9. Describe the cytogenetic effects of ionizing and non-ionizing radiations.
10. Write short notes on any *Two* of the following :-
 - (a) FISH
 - (b) Hfr bacteria
 - (c) Bacterial genomes
 - (d) Flow Cytometry

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology

PART-I, PAPER-VII

(Molecular Biology and Genetics)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Describe the structure of E-coli RNA polymerase and discuss the role of different components of this enzyme in RNA synthesis on DNA template.
2. Describe the two classical experiments which demonstrate the semi-conservative mode of DNA replication.
3. Write an essay on the historical background of molecular biology.
4. What are post-transcriptional modifications ? Describe the 5' cap formation and 3' polyadenylation.
5. Write short notes on any *Two* of the following :-
 - (a) Proof-reading
 - (b) RNA-editing
 - (c) TATA-Box
 - (d) Okazaki fragments

GROUP 'B'

6. Describe the process of translation in a prokaryote.
7. Describe the different mechanisms involved in DNA repair.
8. Describe the process of genetic and physical map and importance of its application.
9. How do the functions of rRNA, mRNA and tRNA differ during the process of protein synthesis.
10. Write short notes on any *Two* of the following :-
 - (a) Central dogma
 - (b) Degeneracy of Codons
 - (c) rho factor
 - (d) Libraries

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NALANDA OPEN UNIVERSITY
M.Sc. Zoology
PART-I, PAPER-VIII
(Basic, Physical and Chemical Principles and Instrumentation)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. What is energy transducers ? How biological energy transducers play an important role in all living organisms.
2. Describe the process of Glycolysis.
3. Write the second law of thermodynamics and its applications.
4. Give an account of effect of radiation in biological system.
5. Write short notes on any *Two* of the following :-
 - (a) ATP
 - (b) Energy rich bonds
 - (c) Hydrogen bond
 - (d) Indicators

GROUP 'B'

6. Describe the principles and working of colorimeter.
7. Discuss in detail that how you will calculate molar extinction coefficient.
8. Give an account of thin layer chromatography (TLC)
9. Discuss Lambert's Law in detail.
10. Write short notes on any *Two* of the following :-
 - (a) X-ray
 - (b) Photo inhibitors
 - (c) Paper electrophoresis
 - (d) Sedimentation

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NALANDA OPEN UNIVERSITY

M.Sc. Zoology

PART-II, PAPER-IX

(Quantitative Biology & Microbiology)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Define arithmetic mean and gives its merits and demerits.
2. Define variance and standard deviation and describe their computations from ungrouped scores of a sample.
3. What do you mean by Correlation Coefficient ? Describe different types of Correlation.
4. What do you mean by hypothesis testing ? Explain type I error and type II error.
5. Write short notes on any *Two* of the following :-
 - (a) Skewness and Kurtosis
 - (b) Rank's Correlation
 - (c) Normal distribution
 - (d) Errors of inference.

GROUP 'B'

6. Give an account of elementary ideas of bioinformatics.
7. Describe the structure, pathogenesis and mode of HIV infection.
8. Give an account of role played by microbes in improvement of dairy industry and in soil.
9. Give an account of negative aspect of microbes.
10. Write short notes on any *Two* of the following :-
 - (a) Industrial microbiology
 - (b) Whooping Cough
 - (c) Nitrogen fixation
 - (d) Antibody

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology **PART-II, PAPER-X** **(Biotechnology)**

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. What do you mean by Southern blotting ? Give an account of major steps involved in isolation of a particular gene from a genome.
2. Describe the principle of spectrophotometer and its two applications.
3. Describe the working of NMR spectroscopy and where it can be used ?
4. What is the principle of electron microscopy ? Discuss the basis of scanning electron microscopy.
5. Write short notes on any *Two* of the following :-
 - (a) Radioisotope
 - (b) FLIM
 - (c) RNA assay
 - (d) Radioactivity

GROUP 'B'

6. What is apoptosis ? Describe comet assay technique for the detection of apoptotic cells.
7. What is fixation ? Give an account of nature of fixatives and properties of chemical fixing reagents.
8. Write an essay on RIA and its applications.
9. Write the description of basic feature of HPLC and its applications.
10. Write short notes on any *Two* of the following :-
 - (a) Biosensor
 - (b) ELISA
 - (c) Flow Cytometry
 - (d) Labelling of antibodies

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology PART-II, PAPER-XI (Immunology, Cell and Tissues)

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. What is innate immunity ? give a detail account of immunogenic innate immune respnse.
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. Give a detail account of structure of MHC molecules.
5. Write short notes on any *Two* of the following :-
 - (a) Atopy
 - (b) Hapten
 - (c) Antigenecity
 - (d) Organ transplant

GROUP 'B'

6. Describe the molecular organization of cell membrane.
7. Describe the role played by microfilament and microtubules in Cytoskeleton.
8. Describe the cell signal hypothesis in relation to sorting and trafficking of protein.
9. Describe the relationship between cell surface receptor and second messenger system.
10. Write short notes on any *Two* of the following :-
 - (a) Microvilli
 - (b) Dynein arm
 - (c) Radial spokes
 - (d) Cilia and flagella

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology

PART-II, PAPER-XII

(Parasitology)

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. Selecting atleast two questions from each group.

All questions carry equal marks.

GROUP 'A'

1. Give an account of life history and pathogenic effects of *Entamoeba histolytica*.
2. Describe the mode of infection effect on human host and life history of *Wuchereria Bancrofti*.
3. Describe the history, symptoms, pathogens and control of malaria.
4. What do you mean by vectors ? Describe the importance in transmission of parasites.
5. Write short notes on any *Two* of the following :-
 - (a) Encystment
 - (b) T-lymphocytes
 - (c) Human louse
 - (d) Kala-azar

GROUP 'B'

6. Describe the types and applications of ELISA.
7. Give an account of prevention and control of poultry diseases.
8. Give an account of antigen and antibody reaction in clinical parasitology.
9. Give an account of different types of cells in immune system.
10. Write short notes on any *Two* of the following :-
 - (a) Natural Killer Cells
 - (b) Macrophages
 - (c) Immunoblot
 - (d) Repetitive antigen

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology

PART-II, PAPER-XIII

(Developmental Biology)

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. Selecting atleast two questions from each group.

All questions carry equal marks.

GROUP 'A'

1. Give an account of structure of mature mammalian gametes.
2. What is capacitation ? Describe the mechanism of capacitation of mammalian sperm in vivo.
3. Describe the post-fertilization events in egg and their significance.
4. Define vitellogenesis. Describe the process in detail.
5. Write short notes on any *Two* of the following :-
 - (a) Graafian follicles.
 - (b) Acrosome formation
 - (c) Gastrulation
 - (d) Semination

GROUP 'B'

6. Give an account of role of ecdysone in insect metamorphosis.
7. What do you mean by transplantation ? Describe the method of bone marrow transplantation.
8. Describe the role of cytoplasm and nucleus in the process of cell differentiation.
9. Define Potency. Discuss in detail the totipotent and pluripotent stem cells.
10. Write short notes on any *Two* of the following :-
 - (a) Neurulation
 - (b) Stem cells
 - (c) Biochemical metamorphic change in amphibians
 - (d) Juvenile hormone

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology

PART-II, PAPER-XIV

(Endocrinology)

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Give an account of histology of pituitary gland and also mention biosynthesis of pituitary hormones.
2. Describe the biosynthesis and function of the thyroxine.
3. Describe the chemistry, source and physiological action of glucagon.
4. Give an account of cortical hormones and also discuss its physiological effects.
5. Write short notes on any *Two* of the following :-
 - (a) Oxytocin
 - (b) Hypothyroidism
 - (c) Hyperaldosteronism
 - (d) Cushing's syndrome.

GROUP 'B'

6. Describe the hormonal control of testosterone production.
7. Describe the role of hormones in carbohydrates metabolism.
8. Give an account of physiology of hormones of ovary.
9. Describe the mechanism of action of hormones.
10. Write short notes on any *Two* of the following :-
 - (a) Addison's disease
 - (b) Implantation
 - (c) Oestrogen
 - (d) Ovulation

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology

PART-II, PAPER-XV

(Entomology)

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Give an account of internal and external genitalia in insects.
2. Give an account cuticle formation and mechanism of moulting.
3. Discuss the process of circulation of blood in insects add a note on blood cells.
4. Give an account of sound producing organs in insects.
5. Write short notes on any *Two* of the following :-
 - (a) Hermaphroditism
 - (b) Chemoreceptors
 - (c) Type of metamorphosis
 - (d) Spiracles

GROUP 'B'

6. Give an account of integrated pest management.
7. Describe the methods for estimation of pest population.
8. Give an account of life history, prevention and control of pests of stored grain.
9. Describe role of chemicals in pest management.
10. Write short notes on any *Two* of the following :-
 - (a) Migrant pests
 - (b) Juvenile hormone
 - (c) Pests of coffee
 - (d) Parasitic insects

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NALANDA OPEN UNIVERSITY

Annual Examination, 2012

M.Sc. Zoology

PART-II, PAPER-XVI

(Ichthyology and Inland Fisheries)

Time : 3 Hours.

Full Marks : 80

*Answer any Five Questions. Selecting atleast two questions from each group.
All questions carry equal marks.*

GROUP 'A'

1. Give an account of food and feeding habit and structure of gastrointestinal tract of a carnivore fish, *Naemacheilus rupicola*.
2. Describe the structure and function of acoustico lateralis system in fishes.
3. Describe the mechanism of gill ventilation in teleostean gills with special reference to buccal pressure and opercular suction pumps.
4. Give an account of ecological status of marine water.
5. Write short notes on any *Two* of the following:-
 - (a) Haldane effect
 - (b) Brackish water farms in India
 - (c) Gondosomatic index
 - (d) Hydrography

GROUP 'B'

6. Describe the control of physio-chemical factors in management in fish farm.
7. Define polyculture. Give its objective and method of polyculture in India.
8. Give an account of method of artificial breeding of fishes.
9. Give an account of prawn culture in seawater.
10. Write short notes on any *Two* of the following :-
 - (a) Brackish water
 - (b) Gear and Craft
 - (c) Fish flour
 - (d) Fish liver oil

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